THE ENGINEERING AND MINING JOURNAL.

VOL. XVIII.—No. 4.—FOURTH SERIES. NEW YORK, SATURDAY, JULY 25, 1874. PRICE 10 CENTS PER COPY.

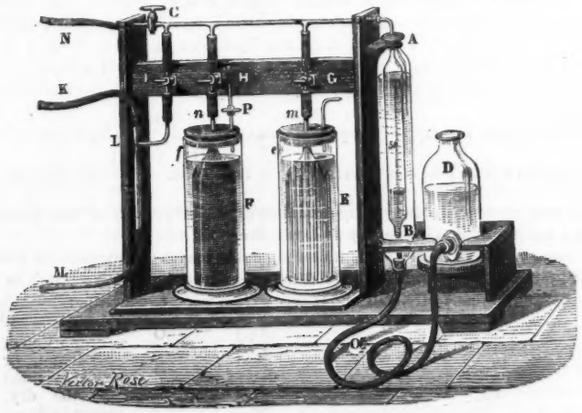
Analysis of Furnace Gases.—Description of the Orsat Apparatus.*

BY PROF. T. EGLESTON, E. M.

(CONTINUED FROM PAGE 35.)

The apparatus consists of a cylinder, A B, drawn down at both ends, and open to receive a graduated tube of such size that every division will represent one-half of a cubic centimetre. The space between the two is filled with water, in order to have the tube, and consequently the gas, which is being analyzed, at a constant temperature, and thus avoid corrections for dilatation. This graduated tube communicates at A with a horizontal capillary tube provided near its extremity with a stopcock, C, through which the gases to be analyzed are introduced into the apparatus. At B, it is connected, by means of an India-rubber tube O, with an opening near the bottom of the bottle D, which serves to produce a current of gas into the graduated tube when it is lowered, and forces the gas out of it when it is raised. The capillary tube A C is connected by two branches, H and G, each one of which has its own stopcock, with two bell jars placed in cylinders E and F, which contain the absorbent liquids.

The cylinder E is filled up to the mark e with a solution of caustic potash at 40° Beaumé. This solution must be filtered under cover. In the bell glass, which it contains, a bundle of tubes, open at both ends, is placed. When the gas enters the bell jar the pressure forces part of the liquid into the cylinder, uncovering the tubes wet with the potash solution, thus presenting to the gas such an amount of surface contact that the absorption is almost instantaneous.



A. B. Graduated tube for measuring the volume of gas having its zero at A.
C. Cock for the admission of the gas.
D. Aspirator.
E. Cylinder containing the potash solution.
e. Mark to show the height of the solution in E.
F. Cylinder containing the ammoniacal chlorhydrate.
f. Mark to show the height of the solution in F.
G. Stopcock for cylinder E.
H. Stopcock for cylinder F.
I. Stopcock for the expulsion of the gas.
K. Tube for the admission of air to the trompe.
L. Trompe.
M. Tube for letting the water out of the trompe.
m. Zero of the cylinder E.
N. Tube for the aspiration of the gas.
n. Zero of the cylinder F.
O. India-rubber tube joining the graduated tube and the aspirator.
P. Stopcock for the admission of air into the cylinder F.

A bent tube in the cork provides for the necessary admission of air. In order that all the joints shall be perfectly air-tight, the corks E, F, A, B are covered with a sheet of India-rubber. Care must be taken when the corks are put in, not to strike the bell glass against the bottom or sides of the cylinder, and to see that the liquids have free access to the bell jar.

The second cylinder F also contains a bell jar, which is filled with a wicker-work roll of metallic copper, which should be slightly conical in shape, and reach to the top of the bell jar. This metallic roll answers the same purpose as the glass tube in E, and, becoming little by little dissolved in the ammoniacal solution with which the cylinder is filled, absorbs oxygen and oxide of carbon. The ammoniacal liquid is composed of two-thirds by volume of a solution of chlorhydrate of ammonia, saturated cold and filtered, and one-third commercial ammonia. It is colorless when prepared, but soon becomes blue in contact with the copper. As it absorbs oxygen very rapidly, the communication with the air is effected by means of a stopcock, P, which is only opened while the cylinder F is in use, and must be closed at the end of each operation.

Care must be taken to see that the ends of the tubes M and N almost touch the stopcocks, and in order to guard against accidents, it is well, when mounting the instrument, to grease the ends of the tubes to make them slip easily. All the rubber connections must be made tight by binding them with two or three turns of copper wire, and twisting them together with a pincers.

The cylinders are filled with the solutions by means of a short rubber tube, which is attached to the end of a funnel, and to the short glass tubes which pierce the corks of both cylinders. As the rubber is rapidly attacked by the solutions, it can be used but once.

When the apparatus is ready, all of the stopcocks are opened, and water acidulated with five to six cubic centimetres of chlorhydric acid is poured into the aspirator D, it remaining on its support until the water reaches 100 in the graduated tube. The object of the acid is to overcome the tension of the ammoniacal vapors, and to neutralize the alkalies, when by accident they enter the capillary tubes.

Before the apparatus can be used it requires to be cleansed of the gas or air it may contain. The connection with the source of supply of gas is made at N and if the conducting tubes are short, the operation may be effected through the stopcock I. By closing G and H, and opening C and I, and then raising and lowering the bottle D, the aspiration of the gas into the apparatus through C, and its expulsion through I, may be effected. When, however, the conduit is long, and of a certain size, it is better to use the trompe L. To do this, a funnel is attached to the extremity of the tube K, and placed under a small stream of water, which need only be a few centimetres in height. The water runs into the tube L, and is discharged at M, and in its passage produces a strong aspiration. By keeping the stopcocks C and I open, the gas may be readily drawn out of the apparatus. It requires about a litre and a half of water to draw out a litre of gas, the quantity varying a little, according to the height of the fall of water. This quantity is a minimum for the ordinary dimensions of the instrument. A litre of water can thus clear of gas a tube four millimetres in diameter, and forty metres long.

By means of the tube N, the apparatus is connected with any series of tubes, in which the gases to be analyzed are cooled, if that is necessary. The tube which penetrates to where the gases are generated will be of different lengths, according to circumstances. It may be simply open at the end, but it is well, in order to have an average specimen to analyze, that its end for a considerable length, varying according to circumstances, should be provided with a longitudinal slit, of at least half a millimetre in width, so that the specimen may be taken over a considerable length at the same time.

The gas may be drawn very slowly, by opening the stopcock C a very little; or the equilibrium between the aspirator and the graduated tube may be established by means of a clamp, which almost closes the tube O, and then causing the trompe to work. In this way a specimen can be obtained which will represent the mean composition of the gas.

The first precaution to be observed, when the apparatus is to be used, is to bring the level of the liquid in the bell jars to the points *m* and *n*, which are the zeros marked on each tube. This is done first for the cylinder E. All the stopcocks, except G, are closed, the aspirator D is raised with the right hand, while the tube O is held with two fingers of the left. The aspirator is then lowered and the liquid rises in the bell glass. It must be allowed to rise slowly towards the zero *m*, and as soon as this point is reached, stopped by a strong pressure of the tube O, which closes it hermetically. This requires a little practice, and if not done with great precaution, the liquid will be sure to rise faster than expected, and enter the capillary tubes, which causes great inconvenience. As soon as the zero is reached, the aspirator D is replaced on its support, and the stopcock G closed with the right hand. The same operation is repeated with the cylinder F, except that the stopcocks H and P must always be opened and closed together.

The cylinders being brought to zero, the graduated tube must also be brought to zero. This zero is a mark on the outside cylinder on its upper part. The gas driven out escapes by the stopcock I. It is not necessary that the liquid should at first come exactly up to the mark on the cylinder, for the section of the capillary tube is not more than a square millimetre. It would, therefore, be necessary, in order to produce one centimetre, or an error of one per cent., that the tube should be one metre in length. The apparatus is thus made ready for work. The stopcock I is closed. The aspirator D is replaced on its support, and the stopcock C opened. The liquid in the graduated tube falls rapidly, and comes to equilibrium at 100. The stopcock C is then closed, and the volume of the sample rectified.

If, as is frequently the case, the pressure of the gas in the furnace flue, or chimney, from which it is taken, is superior or inferior to the pressure of the atmosphere, a little more than 100 centimetres should be taken, the stopcock of admission closed, the aspirator replaced in position for a few moments, and the stopcock of expulsion opened a very little. When the equilibrium has been established, and the gas occupies only 100 c. c., the stopcock of expulsion is closed, and the case is the ordinary one.

By pressing on the tube O with two fingers, the greatest precision in stopping the liquid at any given point, either in the bell glass or the graduated tube, can be arrived at. It is indispensable that this manœuvre should become perfectly familiar before commencing the use of the instrument for analysis. It is important that none of the liquids contained in the apparatus should penetrate into the small tubes, for their capillarity would cause part of them to be retained, and thus oppose the free passage of the gas, and prevent the equilibrium of pressure

*A Paper read before the American Institute of Mining Engineers.

from being re-established, and thus produce irregularities of pressure and volume. If the liquids from E or F should enter them, a part of the gas might be absorbed before it entered the cylinders, thus rendering the analysis inexact. An accident of this kind may always be avoided by proper attention to holding the rubber tube; but if it should happen, it can be remedied without taking the apparatus to pieces. By raising the aspirator D, its acid liquid may be made to pass into the tubes, to neutralize the alkali, and a few drops even may be made to enter the cylinders. By passing a large quantity of air in both directions successively, the tubes may be dried out. This method, however, is long and tedious, and likely, if repeated very often, to injure the rubber tubes. The greatest precaution should be taken to avoid this accident.

When the measurement of the 100 parts to be analyzed has been effected, the aspirator is raised with the right hand and the stopcock G opened. The liquid rises rapidly in the graduated tube, and the gas is forced into the bell glass of E. The liquid is not allowed to go quite to the zero of the graduated tube, it being stopped at will by pressing on the tube O. The aspirator is now lowered and the gas passes again into the graduated tube. This is repeated three times. The third time the whole of the gas should be made to pass into the potash solution, and the liquid in the bell glass and the graduated tube are brought to zero, taking care that in both cases it does not pass into the capillary tubes. As soon as the liquid in E has been brought to zero, the stopcock G is closed. The volume of the gas remaining is now read. To do this the aspirator must be raised, so that the level of the liquid shall be the same in it and the graduated tube. Exactly the same operation is repeated for the cylinder F, except that care must be taken to always have the stopcocks H and P opened and closed at the same time. If there are more than two cylinders, the same operation is repeated for them all. It is always necessary, when a reading is to be made, to place the aspirator against the cylinder A B, and to bring the liquids in both vessels to the same level. This avoids the errors that would arise from difference of pressure, if the levels of the liquids were not the same in both vessels. Generally, the quantity of liquid in D is such that when it is placed on its support, its liquid is on a level with the graduation 100, in the graduated tube.

The cylinder E will take up all the gases which can be absorbed by potash. In general, this will be only carbonic acid. It may, however, be used for the absorption of the sulphurous acid, sulphuretted hydrogen, and chlorine. These gases can, however, in general, only be determined when they occur alone. Sulphurous acid can be determined in the presence of carbonic acid by the use of a solution of bichromate of potash in sulphuric acid, or by the use of permanganate of potash.

The cylinder F will absorb all the free oxygen and oxide of carbon. In general, these two gases cannot co-exist in a furnace. If, however, they should be found together, and no carbides of hydrogen or oxygen should be produced from the fuel, a very close approximation of their relative proportions can be obtained by calculation, as will be shown.

When the liquids are freshly prepared, the absorption of the gases is almost instantaneous. It is well, however, to pass the gases at least three times through each cylinder. The degree of concentration, however, is such that at least 2,000 analyses can be made without diminishing the absorbent power of the liquids more than one-half. When the apparatus has been used several times a day for more than a year, the gases must be passed oftener. In order to ascertain at any time the exact strength of the liquids, an analysis of any chemically pure gas, prepared for the purpose, may be made. A mixture of equal parts of pure carbonic acid and atmospheric air may be used, or, what is still easier, an analysis of air, which should always contain 21 per cent. of oxygen, may be made.

(TO BE CONTINUED.)

The Classification and Heating Power of Coals.

Translated from the French of M. L. GRUNER, by R. P. ROTHWELL, Mining Engineer.

(CONTINUED FROM PAGE 35.)

At present I desire to draw attention to another fact which comes from the preceding table.

The actual heating power of all fuels, except the bituminous lignite of Bohemia (which, from the large amount of hydrogen it contains, resembles the petroleums*) is not only greater than the heating power calculated by Dulong's formula, but, also, for the anthracites and bituminous coals, it is greater than the sum of the calorics due to the entire amount of carbon and hydrogen contained in them, taking them as isolated, and after making deduction for the oxygen.

Thus, coal from the	Chaptal Mine	gave	9622	Calorics	against	C+H=	8670
" " "	Ronchamp	" "	9077	"	"	"	8790
" " "	Denain	" "	9050	"	"	"	8310
" " "	Louisenthal	" "	8215	"	"	"	7824

M. SCHEURER-KESTNER, noticing this apparent anomaly, concluded that the combination of carbon and hydrogen in coals was attended with absorption of heat, as is the case with explosive compounds. The anomaly is, however, only apparent. Coal has none of the properties of explosive substances, and if the actual heating power is higher than that obtained from calculation, it is, as we have already remarked, because we take the number 8080 calorics for carbon, while, in reality, we should take a number nearer to 11,214, which is the theoretic heating power of carbon in the form of gas.†

In any case it is evident that, considering this number 11,214 calorics merely as the result of a purely theoretical speculation, the but *slightly condensed* carbon of bituminous coal should produce more heat than pure carbon from wood charcoal. On the other hand, for *solid* hydrogen we should take a number smaller than 34,462 calorics which corresponds to gaseous hydrogen, producing water, which is also taken in the gaseous state.

We can readily satisfy ourselves that we would obtain values nearer the truth by assuming, for example, 9000 calorics as the heat of combustion of carbon in coal, and 30,000 calorics as that of solid hydrogen; we would thus find, after deducting for the oxygen:

For coal from Auzin	8865	instead of	9257
" " " Denain	8883	"	" 9050
" short-flaming fat coal from the Chaptal mine, (Creuzot)	9286	"	" 9622
" coal from Ronchamp	9385	"	" 9077
" dry coal from Montceau	8641	"	" 8323
" " " " Louisenthal	8322	"	" 8215

The agreement is not, however, satisfactory; we note that the calculation gives too low a value for coals rich in fixed carbon, and, on the other hand, too high a value for those which leave but little coke. In brief, it is evident that the manner of combination of the elements in coals is too variable to make it possible to determine their true heating power from simple elementary analysis. We must, therefore, determine by direct experiment the heating power of each kind of coal, or else we must be satisfied with the mean results which we obtain by combining the Mulhouse experiments—a summary of which is given in the above table—with the numerous industrial tests made by Dr. BEIX, in Berlin, and by the French and English navies.

I will give the results thus obtained while discussing the other properties of the various kinds of coal, and will now commence the study of these mineral fuels.

We know that all fuels, except, perhaps, certain petroleums and graphites, are of vegetable origin; some, such as wood and peat, are forming daily before our eyes; others, the fossil fuels, long buried deep in the earth, have undergone changes which have greatly altered their original nature. The color has changed gradually from white to brown and black; the density has been more than doubled; a portion of the oxygen and hydrogen has disappeared, carrying with it a little of the carbon; the oxygen, especially, is eliminated, so that the solid fuel, thus altered, contains in general a large proportion of carbon and a smaller proportion of oxygen as the alteration is further advanced.

In examining the elementary analyses of pure ligneous matter—*cellulose*—we perceive that the proportion of oxygen exceeds that of carbon one-tenth, while in the most altered fuels—the anthracites—it is scarcely one-fortieth part of the carbon. The relative diminution of the hydrogen is also noticeable, though much less marked. In cellulose we have for 1,000 carbon 139 hydrogen; in bituminous coals there remains 75 to 40 of hydrogen, and in the anthracites 40 to 25.

Finally, since the oxygen disappears more rapidly than the hydrogen, the different fuels can be best characterized by the ratio $\frac{O}{H}$ or $\frac{O+Az}{H}$ (though the proportion of nitrogen is always very small) or by the proportion of coke (charcoal) which the destillation of the dry fuel, free from ash, produces.

I sum up these facts in the following table, which is intended to indicate types, for here, as elsewhere, there is no rule without exception; and, in fact, the fuels form a perfectly continuous series from wood to graphite:

Names of Fuels.	Ratio $\frac{O}{H}$ or $\frac{O+Az}{H}$	Proportion of Charcoal, or Coke, yielded by the dry, pure fuel.
In pure Cellulose we find	8	0.28@0.30
" Wood (Cellulose and encasing matter,)	7	.30 .35
" Peat and Fossil Wood	6@5	.35 .40
" Lignites,*	5	.40 .50
" Bituminous Coal	4@1	.50 .90
" Anthracite	1@0.75	.90 .92

Among the fuels, the bituminous coals are by far the most important; they alone will receive our attention here.

The specific gravity of pure bituminous coals containing but a small amount of ash is from 1.25 to 1.35; those richest in carbon are the heaviest. The weight of a cub. metre, in pieces, varies from 700@900 kilogs. (1,400@1,800 lb.)

In an industrial sense, we may classify coals under *five* types, with well-defined characteristics; but, as there is an insensible graduation from one type to another, there may be some doubt as to the class to which belong the fuels approaching the limits between the classes.

The elementary composition of bituminous coals varies within the following limits:

Carbon	75	to	93
Hydrogen	6	"	4
Oxygen (including azote)	19	@	3
	100		

The five types are characterized as indicated in the following table. This is the classification which I long since adopted in my lectures on Metallurgy; it is

* Petroleum and the petroleum rocks (bituminous shales) form a series altogether distinct from the coals; they are characterized by a higher percentage of hydrogen, which gives them a considerable heating power, though the proportion of fixed carbon is small. I include in this series the solid bitumens or asphalts, the bituminous lignites of Bohemia, Scotch bog-head, jet, certain varieties of Cannel coal, etc.

† The number 11,214 calorics is obtained as follows: We know that carbon develops 2473 calorics when it is transformed into oxyd of carbon, and this gas, in its turn, gives 8080−2473=5607 calorics in combining with a new equivalent of oxygen; that is, equal quantities of oxygen apparently develop very unequal quantities of heat—I say *apparently*, for in the first case the solid carbon passes to the gaseous condition, while in the combustion of carbonic oxyd it is carbon in the condition of gas that burns. Now, if we admit with RANKINE that WELTHER'S law obtains so long as the chemical reactions are neither accompanied nor followed by a change of condition, we see that the excess of (5607−2473)=3134 calorics should correspond exactly with the heat absorbed by the gasification of carbon, and consequently gaseous carbon would develop 8080+3134=11,214 calorics, if it gave carbonic acid directly.

* Not including Bituminous lignites which resemble the petroleums, being very rich in hydrogen.

the outgrowth of numerous analyses, which will be given in detail under the description of each of the types:

Names of the five types or classes.	Elementary Composition.			Ratio O(1) / H	Proportion of coke yielded by distillation	Nature and appearance of coke.
	C	H	O (1)			
Long-flaming dry coals	75@80	5.5@4.5	19.5@15.	4@3	0.50@0.60	Pulverulent.
Long-flaming fat or caking coals, or *gas coals*	80@85	5.8@5.	14.2@10.	3@2	0.60@0.68	Melted but very friable.
Caking fat coals (properly so called), or *Blacksmith coals*	84@89	5. @4.5	11. @5.5	2@1	0.68@0.74	Melted. Somewhat compact.
Short-flaming fat or caking coals, or *coking coals*	88 91	5.5@4 5	6.5@5.5	1	0.74@0.82	Melted. Very compact.
Lean, or Anthracitic coals	90@93	4.5@4.	5.5@3.	1	0.82@0.90	Pulverulent.

(1) This oxygen includes the azote, the proportion of which rarely exceeds 1 per cent. of the weight of the fuel.

This classification differs but little from that by REGNAULT; my first three classes correspond with his; the difference is in the last two. I separate completely the bituminous coals from anthracites, and I leave in the class of lean coals, those of which the coke has still some tendency to melt.

I insist, also, on the distinction to be made between *dry* and *lean* coals. Usually the terms are used indifferently to designate non-caking coals. I propose to apply the term *dry* to those coals where the non-caking quality is owing, as in the lignites, to the large proportion of oxygen; and, on the other hand, I apply the term *lean* to the coals which graduate off into anthracite, on account of the large proportion of carbon and small amount of hydrogen they contain. I would also remark that this classification is founded especially on the proximate analysis—that is to say, on the proportion and nature of the residue left after distillation; this corresponds, as I have already demonstrated, to the heating power. The table which gives the elementary composition shows, morever, a gradual increase in carbon and diminution in oxygen as we go from one class to another; but we note, also, that there is not always a coincidence, for certain *long-flaming* coals contain more carbon and less oxygen than many smithing coals, which leave, nevertheless, a larger proportion of coke. These anomalies are due to the very different manners of combination of the elements and their greater or less degree of condensation.

The five types can be recognized to a certain extent by their external character; though, to avoid error, they should be submitted to a proximate analysis.

Long-flaming coals, allied to the lignites, are comparatively hard, ringing under the hammer, strong, with uneven fracture, dull black, and with a streak brown rather than black.

As the oxygen, and consequently the proportion of water, yielded in distillation diminishes, the coal becomes more friable, ringing less under the hammer, blacker and heavier. The brilliancy increases especially with the proportion of hydrogen, as does also the coking property. Finally, bituminous coals which pass over to anthracite are jet black, and, in general, rather harder than the short-flaming caking coals.

These different properties are greatly modified by the proportion of earthy matter contained. The specific gravity and hardness increase with the proportion of ash, though the brilliancy diminishes.

The *combustibility* and *length of the flame* depend on the volatile elements. The coals nearest the lignites ignite easily, burn with a long flame and much smoke. They are termed *flaming* coals. Those that contain but little volatile matter, and particularly but little hydrogen, ignite and burn less easily, and last longer in the fire; the flame is also short, and with but little smoke.

The combustibility of coals depends also on the nature of the ashes; when these are ferruginous and calcareous, they form clinker; purely argillaceous or siliceous ashes remain pulverulent, and obstruct combustion much less.

Among the argillaceous ashes we find almost always a small proportion of potash or soda. We also find phosphate of lime,* which, together with the alcalies, gives these ashes fertilizing properties.

The above classification is in accordance not only with the heating power, but also, to a certain degree, with the *Geologic Age*. Thus, *in the majority of coal basins*, we note that the highest beds are the richest in volatile matter. This, however, is only true for beds of the same basin, and, we should add, for those following each other in *the same vertical section*, for coals vary greatly from one basin to another, and in the same bed in different parts of the same basin. Thus, the great bed of Rive-de-Gier is long-flaming in the eastern end of the basin, and anthracitic in its western extremity. In Wales, the coals are *fat*, or caking, in the East, and *lean* in the West. In the Ahun basin (Creuse) the same bed furnishes a lean coal near the middle of the basin, and a caking coal at each extremity, at less than 3,000 metres from the middle portion. The Scotch coals are long flaming and dry, though belonging to the lower coal measures; while the coals of the Alps are anthracitic, even in the highest of the Carboniferous measures.

TO BE CONTINUED.

* MM. LE CHATELIER and L. DURAND-CLAYE have recently shown that the ashes of certain coals contain sometimes 0.50 and even 1 per cent. of phosphoric acid.

Cost of Mining Coal—Rate of Wages etc., in the Red Bank Region, Pa.

IN the ENGINEERING AND MINING JOURNAL of June 27th, we gave a short description of the Red Bank Mining Region of Western Pennsylvania. From its geographical position, the abundance and good quality of its coals, and the facilities for getting them to market, it is evident this region must become one of the principal sources of supply for the northern and north-eastern markets; indeed, we note that the Grand Trunk Railway of Canada already anticipates a reduction of from 15 to 20 per cent. in the cost of its fuel since the opening up of this field. We now propose to give some idea of the cost of mining coal in this favored region.

As already stated, the beds are all above water level, they vary in thickness from 3½ to 12 feet, are nearly horizontal, and, in general, regular and free from faults, with good firm roofs and floors, and are free from shale bands in the seams. They possess, in short, the conditions necessary for economical mining; the miners consequently receive but 60 cents per ton (2000 lb.) for cutting and loading the coal, while at Pittsburgh they receive from 3½ to 4 cents per bushel of 76 lb.—that is, 92 to 1.05 cents per net ton.

The system of mining adopted in the mines of this region is the chamber and pillar work, the gangways or entries being driven about 7 feet wide, as are also the entries, 15 feet long, to the rooms. The rooms are made 20 feet wide, and pillars about 16 feet; it is the intention to rob these in "coming back;" in some cases this is now being done, but very little coal being lost.

The miner cuts or "bears in" in the coal a little above the floor of the seam, as far as the length of his pick will allow, two shots will then bring down the coal across the entire face of the chamber. The consumption of powder in a 4 feet bed, with a free parting on top, amounts to about one pound for five tons of coal, or about one-fifth the amount necessary in our large anthracite beds; it is, however, a larger consumption than is required in many of our bituminous mines, where the coals are softer.

The miners generally work single, and one man cuts and loads, on an average, five tons per day; the best men will make six and even seven tons in their day of 9 to 10 hours. The miner also cuts, loads, unloads, and sets his own props, lays track, which, in the gangways, is usually 16 lb. T rail, and in the rooms, generally 3×4 in. oak rails. The gauge of track is 36 inches, and the mine cars hold about 3000 lb., and cost $50.

The coal, as it comes from the mine, is dumped over bars one inch apart, and which should have an inclination of about 5 to 6 inches in 12. After passing over these bars the large coal runs on to a sheet iron tray or apron, which forms a portion of the main shoot, and is suspended from a weighing machine. The coal is here weighed before entering the railroad cars, and the miner is paid by this weight, 2000 lb. being counted a ton. The coal which passes through the first screen is run over a second screen of bars ¾ inch apart; what goes over these is "nut coal," what passes through them is "slack;" the former is sometimes mixed with the large coal, particularly when it is intended for locomotive use. The nut coal can always be sold, but the slack is often lost. Coking has not been as yet introduced into this region; there is little demand for the slack, and in its natural condition it will not pay transportation to a market. The establishment of iron works will doubtless make it valuable, for these coals, when freshly mined, coke well.

The miner is paid 60 cents. per ton in room work, and 60 cents per yard, in addition to the coal, in driving gangways or opening rooms. In the Cannel coal vein, where he has to handpick all the coal, taking out a band of shale which with the fine coal left in the mine, amounts to nearly 30 per cent. of the coal cut, he receives 80 cents per ton.

The following are about the proportions of the different sizes made where the bed is large and regular; by a better arrangement of the dump a still greater proportion of large coal might be obtained.

Lump, about 88 per cent.; nut, 6 to 7 per cent.; slack, 6 to 5 per cent; in other cases the slack and nut together amount to about 20 per cent. of the whole. This proportion shows that the coal is hard, and will stand transportation.

Inside labor is paid $1.75 to $2 per day; blacksmith, $2.50; check man or weigh master, $2; outside labor $1.50. The hauling from the face of the rooms to the head of a plane at the entrance to the mine, is contracted for at the Fairmount mine at 8 cents per ton, the company furnishing the mules, but the contractor feeding them. At present one boy and one mule are counted to every 50 tons of coal. One man dumps and weighs 200 tons per day. Miners are charged $1 per month for smith's work, sharpening tools, etc. Powder costs $4.25 per keg (25 lb.); house rent, for house with three to six rooms, $4 to $6 per month; coal delivered, $2.50 per ton; best quality flour, $8 per barrel. Our miner will have nothing but the best of everything; sugar-cured hams, 10½ cents per lb.; bacon, 9½ cents; fresh meat, 10 cents; sugar, 12½ cents; coffee, 30 cents; tea, $1.40; butter, average price, 20 cents; boots, $5.50; men's shoes, $2.75; a good suit of clothes, $15; pants, $3; overalls, 80 cents, etc. These figures will afford some indication of the real value of labor and cost of mining in this region. To the above items of cost we must add general expenses, superintendence, repairs, etc. Ground rent, which we may assume at 25 cents per ton, (the Red Bank Mining Company owns its lands in fee) interest on investment in improvements, personal property, etc., depreciation of improvements, etc. etc., and we may put down the total cost of a ton of coal at $1.20 to $1.25 delivered on the railroad cars.

The distance from the Red Bank Mining Company's mines to Erie is 160 miles, to Buffalo 225 miles, Oil City 87 miles, Williamsport 170 miles. The market for these coals will be the oil regions, the railroads and cities of the North and North-east, the lake ports and Canada, and the gas works throughout the North, a market already consuming several million tons each year, and one which will rapidly increase. With these advantages in cost and quality of coal, and in proximity to an almost unlimited market, there can be no question about the future importance of this coalfield.

THE ENGINEERING AND MINING JOURNAL.

NEW YORK, SATURDAY, JULY 25, 1874.

ROSSITER W. RAYMOND, Ph. D., Editor.
RICHARD P. ROTHWELL, C. E., M. E.,
Editor of the Coal and Iron Department.

The Engineering and Mining Journal, is devoted to Mining, Metallurgy and Engineering. Communications on these subjects will always be welcome.

It is the Official Organ of the American Institute of Mining Engineers, and it alone publishes the valuable papers read before that influential society.

Correspondence and general communications and books for review should be addressed to the Editors. Business communications should be addressed to the Secretary.

Remittances should always be made by Post-Office Orders or Bank Drafts, made payable to WM. VENTE, Secretary.

Subscription $4 per annum ; $2.25 for six months, in advance.

Advertising Rates. Inside pages 25 cents per line each insertion. Outside pages 40 cents per line. Special reduced rates will be given on application for advertisements extending over a long time or occupying a large space.

The legal rate of Postage on the ENGINEERING AND MINING JOURNAL addressed to its regular subscribers, is 20 cents per annum, or 5 cents per quarter, PAYABLE IN ADVANCE. Subscribers who receive their copies by letter-carriers will please hand the annual or quarterly postage to the carriers, taking their receipts. If any higher rates are demanded, report the facts to the local Postmaster. The postage on copies directed to subscribers in New York City has been prepaid by the publishers.

THE SCIENTIFIC PUBLISHING COMPANY.
WILLIAM VENTZ, Secretary,
P. O. BOX 4404. 27 Park Place, New York.

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WE regret to learn that Dr. FEUCHTWANGER, so well known as a chemist and mineralogist, has decided, on account of the sudden death of his only son and partner in business, to retire from active life, and he offers his large and valuable collections of minerals for sale.

These collections consist of some 2,000 specimens and 1,200 varieties, 12 or 1,500 large specimens in glass cases, several cabinets of gems and many hundred fossils.

This is a rare opportunity for one of our colleges to acquire a very complete collection, accumulated with immense trouble and expense.

THE citizens of Philadelphia are to be congratulated. The agitation of the manner in which the Gas Trust has been discharging its duties, and the severe arraignment of the Trustees by Mr. HENRY C. LEA, are beginning to bear fruit. The Trustees are, we understand, going to give a trial to Mr. LOWE's new process of making gas, and a place is being prepared to give it a practical test. We understand a very superior illuminating gas can be manufactured by this process at a cost not exceeding 50 and 55 cents per 1000 feet.

The publication of an abuse generally brings some relief, and we are glad to see that even the Philadelphia Gas Trust is not impervious to criticism.

WE learn with pleasure that Dr. THOMAS M. DROWN has been unanimously elected by the Trustees of Lafayette College to the professorship of analytical chemistry in the Pardee Scientific Department. Dr. DROWN will prove a valuable acquisition to the college. Unsurpassed among American chemists in accuracy and breadth of theoretical knowledge, and in precision and skill of manipulations in the laboratory, he is also, by virtue of an extensive practice, by his position as Secretary of the Institute of Mining Engineers, and by his career as a writer on metallurgical subjects, intimately connected with the great industries which depend upon chemistry and its applications ; and in his hands the chemical department at Lafayette will acquire and maintain what such departments are too likely to lack, vital relations with the busy world.

The American Institute Fair.

TO THOSE who visited the Fair of the American Institute last year, the announcement of this year's Exhibition, which has appeared in our advertising columns for some weeks past, will be very welcome. To such of our manufacturing friends as did not take advantage of that opportunity to exhibit their products, we would say a word. There is no better advertisement for good machinery than to put it on exhibition in running order ; and there is no place where it can be exhibited to such advantage, or where it will be seen by so many interested in its use, as at the Fairs of the American Institute in the city of New York. This consideration, in these hard times, should induce a very full representation by our manufacturers, and those who are not represented will certainly suffer by the competition of their more enterprising rivals. In dull times nothing but persisting advertising, the keeping constantly before the public of your machinery or manufactures, can secure the few orders that are given out ; and those who adopt this policy are doing the entire business of the country. Such an opportunity as this Fair presents should not be lost, and we hope to see there represented a large number of our advertisers. The descriptions of machinery and the notices of products that will be made by the leading papers, the ENGINEERING AND MINING JOURNAL among others, will make the articles exhibited known throughout the length and breadth of the land, and cannot fail to be the means of securing orders.

But aside from these purely selfish ends which we have held up as inducements for exhibiting, the honor of the country, the benefit derived by our manufacturers from these opportunities to learn and compare the latest improvements in machinery and manufactures, is surely not a matter of indifference to our enlightened citizens. Experience has long shown that the benefit from Industrial Exhibitions can scarcely be over-estimated, whether we consider their influence on individual prosperity or on the commonwealth, and the success of the American Institute Fairs in past years shows that our most intelligent and enterprising citizens from every part of the country fully appreciate them.

The announcement above referred to states that the Fair buildings will be open for the reception of heavy machinery August 17th, and for other articles, August 31st. The Exhibition will be opened Sept. 9th, 1874.

EDITORIAL CORRESPONDENCE.

Mariposa County—Hite's Cove Mine.

MARIPOSA CO., California, June, 1874.

THE extension of the railroad from Lathrop southward, up the valley of the San Joaquin, renders it a much easier matter than it used to be, to get into the Sierra in this county—world-renowned as the locality of Yosemite. Formerly one had a dismally dusty ride from Stockton by stage, twenty-four hours of which is now obviated. At present, the traveller, leaving San Francisco in the afternoon at 4, arrives at Merced City the same evening at 11, retires to a comfortable night's rest in the new and handsome big hotel "El Capitan," and leaving by stage early next morning, may be at Mariposa for dinner, at GALEN CLARK's for a royal supper and a romantic and luxurious repose, and in the Yosemite itself early next afternoon. Or, going by the Coulterville route, he may achieve the journey in perhaps a little briefer time, and all the way on wheels. I advise him to go by Mariposa—but that's neither here nor there. What I mean to write of at present is not the Yosemite nor the ways of getting there ; and if the traveller has taken a ticket (mentally) from me, supposing it to be a through ticket, let him step up and get his money back ; for right here at Mariposa he is to stop and turn off.

Rambling about the famous and beautiful Mariposa Grant was always a favorite occupation of mine. Many a mile in all directions have I traversed its hills and valleys, and often have I pierced, candle in hand, through the dim subterranean recesses of its mines. Nothing is more exhilarating than a gallop on a fiery mustang (that don't buck) through the glades and along the glades, between the old Pine-tree and Mariposa. This year I found the charms of nature as great as ever ; but the activity of man had declined. Empty houses at Princeton and Mariposa showed the effect of the suspension of mining at those places. In fact, all the operations of the Company are standing still, except the deep adit which is running from the Merced at Burton Mills, along the great vein, to explore and open the deeper portions of the Josephine and Princeton, as well as other bodies of auriferous quartz indicated by promising outcrops on the face of the hill. As this adit is run, on account of the softness of the rock, alongside of the vein, and not in it, it reveals nothing as it proceeds ; but cross-cuts will be made, from time to time, to test the character of the quartz. The Burleigh drill, operated by compressed air, is employed in the work, and a few hundred feet have been accomplished. I do not give the figures, as they are not satisfactory to anybody. The machine first ordered was inadequate ; and a larger and stronger one is now to be introduced, with which rapid progress can be made. It will be months, undoubtedly, before this new enterprise can advance so far as to be the basis of active mining on a larger scale. I suppose the Company, exhausted with the long and complicated struggle over former debts and title, is not in a position to carry on improvements elsewhere with energy. Otherwise, I should wonder why the so-called "New Princeton," a promising opening on the apparent continuation of the celebrated old Princeton, is not vigorously developed. But it is useless to raise conundrums. The population of the region has assumed an air of patient waiting for the good times to come back. Whether they ever will, while the whole of the vast estate is managed piece-meal, is more than I can say. The present operations of the Company will benefit Bear Valley chiefly ; and nothing is to be immediately done for the rest of the Grant.

From Mariposa, a road of eighteen or twenty miles leads over the hills and along the Chowchilla Valley to the picturesque locality known as HITE's Cove, on the South Merced. I rode over it rapidly, hard pushed for time, accompanied by a guide. We were well-mounted, as one is almost sure to be, taking horses in these mountains. At the East, I should not expect to get a good saddle-horse by simply asking for one at a livery-stable. But here everybody rides ; and the Spanish horses kept for the purpose are almost invariably light and sure of foot, easy of gait and "bound to go till they drop." It was all by virtue of such excellent horseflesh that I was able to accomplish what may be considered a pretty

good piece of travel. Leaving Merced with a team and buggy one evening, we drove over the mountain road 40 miles to Mariposa before midnight. The next morning, with fresh horses, we rode twenty miles to HITE's Cove, staid there a couple of hours, rode back to Mariposa, picked up the first team and drove back the same night to Merced, making in all about 80 miles of driving and 40 of riding in twenty-nine hours. But this would be comparatively nothing on level roads. The art of getting ahead in the mountains does not lie in high speed, but in steady pushing on. Press as you may, you can scarcely make over seven miles in an hour, and frequently not more than four.

This is the way HITE's Cove looked to us, as we checked our mustangs on the summit of the last hill on the road : a deep, precipitous, romantic gorge, through which tumbled the South Merced ; side gorges emptying into this, and filling the landscape with infinite variety of surface, clad in forest, chaparral or bold outcropping rocks ; opposite us, a steep sharp mountain ridge, separating the South Merced from the main river ; beyond that, first, a deep cañon, and then other ranges and summits. The cañon is felt rather than seen. One instinctively conceives, from the dim blue haze that hangs over it, and from the configuration of the mountains eastward, that it must lead up to something grand. A safe presentiment ; for, by taking yonder slender trail over the divide into the cañon, and following up the stream a dozen miles, one may ride under the shadow of a famous rock known as El Capitan, and guarding the entrance of Yosemite. In fact, this is one of the best trails into the great Valley, though impracticable for wheels, and at present not employed to any extent by tourists.

On the face of the divide already mentioned, may be seen the indications of a successful and actively prosecuted mining enterprise—dumps, both large and fresh ; cars running out of a tunnel, down a steep tramway, to a stamp mill, and tailings from the mill staining the current of the stream. But not all these are visible from the top of the hill on the Mariposa road. The buildings and the mill are too deep in the gorge to be seen ; and the distance is too great for discerning the details, even of such operations as would be otherwise visible. For the South Merced flows some 2500 feet below the hill-top, and the distance in air-line obliquely across to the mines cannot be less than a mile. To reach the mine after having seen it requires a journey of five or six miles down a steep, zigzag trail, cut in the side of the hill. All the supplies for the settlement and mine at HITE's Cove are carried down this trail. The wagon-road ends a mile or two below the summit of the hill, at a store house, where everything is unloaded till required. We passed a gang of Chinamen, laboriously rolling over and over, down the trail, a heavy iron-casting for the mill. (A piece of cast-iron is a harmless thing enough to happen upon, in a day's ride ; but that demoniac cannon of VICTOR HUGO, banging around between decks, is a sample of the harm of harmless things when they once break loose ; and a stolid, motionless chunk of metal, though it budges not, but merely occupies half of a path which was none too wide before, may mightily affect the soul of a sensitive mustang. *His* mettle is by no means stolid, and his rider, not relishing a waltz on the edge of a precipice, gets off in undignified haste, and hauls the charger past the dreadful object. The mustang has read '93, no doubt, and thinks there's no knowing what one of those quiet monsters may do, if HUGO gets hold of him. In passing, he writhes and doubles like a trout *en route* from brook to shore.)

Arrived at the bottom of the tedious hill, we gallop for a mile along the banks of the river, and at last, turning a projecting point, come suddenly upon the settlement, situated at the narrowest part of the rocky gorge, and plastered, as it were, against the mountain side. A slender suspension bridge leads over to the cluster of buildings, comprising boarding-house, store, stamp-mill, a dwelling or two, blacksmith's shop, etc. The houses stand on narrow terraces, wherever they can get room ; and above them all, the blue dump of the mines, a thousand feet higher than the river, hangs like a horn of plenty inverted over the settlement. This is indeed scarcely a figure of speech. The mine is the sole source of existence of a settlement in this wild, secluded hole in the mountains. Mine, town and everything belong to Mr. JOHN R. HITE and his partner ; and for about eleven years, almost unheard of by the outside world, they have been steadily and profitably moving. Not being a stock company, and having no motive for advertising the value of the property, they have made no appearance in California St., or Wall St., or Lombard St., and at this day few Californians, even, are aware of the existence at HITE's Cove of one of the most remunerative mines of the State.

The characteristic features of the HITE's Cove mine may be summed up (having previously been boiled down) as follows : Vein, 4 to 18 feet wide ; course, N.W. and S. E., nearly ; dip, 80° N.E. ; country, rock slate ; quartz, white and bluish, with black seams, and heavily charged in places with arsenical pyrites. The gold is fine and seldom visible. Average yield in mill, the year round, $35 per ton. Length of claim, 1500 ft. ; no mines on extensions. Within the claim, three pay-shoots, between which the vein pinches. The largest is on the West end, and extends horizontally 300 feet. Vertical depth unknown. Another, at the east end, is 250 feet in horizontal ; and between these two there is a third, of smaller dimensions. In depth, the limits of these bodies have not been reached, though they are opened through a vertical distance of 600 feet.

The mountain in which this vein occurs has a general course not far from that of the vein. The outcrop is perhaps a thousand feet above the river. The entries to the mine, besides the discovery shaft, are two cross tunnels, cutting through the foot-wall. The upper tunnel is 210 feet long, and the lower one, 500 feet below it, is 1400 feet long. The latter has been recently completed, and will be the working entry. The body of reserves is nearly 600 feet in height, measured on the vein. As to the quality, both tunnels and the wings and shafts in the vein corroborate the prolonged experience of the mill, in promising a maintenance for years to come of the uniformly profitable character of the quartz. It contains an average proportion of 2 to 3 per cent. of arsenical pyrites. In pieces which are more heavily impregnated, or massively charged with sulphurets, the contents of gold are high—running up sometimes into the hundreds. The complete natural drainage, easy transportation to mill and large size of the lode, render mining cheap. Last year the mining expense was $2 45 per ton of rock worked. Add as much more for milling (an excessive estimate, since the mill is run with a turbine-wheel), and you have the total running expense, to which, fortunately, there are no heavy office-expenses, law-fees, salaries, etc., to be added. Mr. HITE manages the mine himself. Miners' wages, $50 and $55 coin per month, with board.

The mill, close to the river, contains 20 stamps, weighing 500 pounds each, and dropping 9 inches 65 to 70 times per minute. The capacity is 20 tons per day, or 1.33 tons daily, per horse-power exerted by the fall of the stamps—a good average degree of efficiency. Quicksilver is used in the battery and on a small apron (copper-plated) in front. After this, the pulp is treated in WHEELER & RANDALL Excelsior pans, of which there are three to the 20 stamps, and settled in one large Varney pan, which is palpably insufficient for the work it has to do. There ought to be at least two settlers.

A PEER and LANQUIST concentrator, for concentrating the sulphurets after panning, is on trial in the mill. It is a cast iron ellipsoidal concave shaking-table, evidently intended to imitate the motions of the horn spoon and pan of the placer-miner. The machine is clumsy, and the principle appears to me erroneous.

The hand-implements referred to are mechanically not satisfactory, but imperfect and slow in operation. Their excellence consists in their cheapness, portability and rudeness. Rudeness may be a virtue in a tool, under some circumstances. Thus a jack-knife is rude compared with a chisel, gauge or auger ; that is, rude for each special purpose. But its rudeness leaves room for varied application and the control of the skilled hand. The thing to carry in your pocket is a jack-knife. And so a horn spoon or pan, which leaves everything to the skill of the operator, varying his motions to the nicest shades of necessity, is a very good thing to be joined to human intelligence, for the performance of work. But I would as soon think of building a machine with an arm and a knife, to whittle bed-posts, instead of a lathe to turn them, as to imitate in rigid mechanism the free swing and shake of the pan, or the delicate and variable indications of the spoon. Moreover, these two contrivances concentrate without previous concentration or sizing, which ought never to be done with a machine. The reduction of all material to uniform grades of fineness is an indispensable prerequisite to successful concentration, as might be shown with learned equations and demonstrations, if the principle were not so well known. There is nothing in the results obtained this far at the HITE's Cove mill, from the concentration referred to, to invalidate the considerations just set forth. But the trial is not yet over.

A BLAKE crusher prepares the rock for the stamps, to which it is delivered by a STANFORD self-feeder (described and figured in the last published report of the U. S. Com'r of Mining Statistics). Mr. HITE says it works very well, securing no special saving of labor, but an increased capacity of 1-5 for the mill. The loss of quicksilver in this mill is insignificant—about three flasks per annum. The greater part is used in pans and settler.

After a very agreeable visit, we reluctantly bid our cordial host adieu, and address ourselves to the long journey between us and midnight, climbing first of all the long winding grade out of the Cove beneath the rays of a westering and somewhat blistering sun.

R. W. R.

CORRESPONDENCE.

Mining in Nova Scotia.

CUMBERLAND, N. S., June 30, 1874.

TO THE EDITOR : SIR—Were a complete history of the mining enterprises in this Province written, it would be found to repeat in miniature that of similar ventures in the great mineral regions of the world. There have been some successes and there have been some failures. The country, closed against general mining by the special grant of its minerals to the Duke of York, remained unexplored until the year 1858, when the title to all the minerals, except those then actually being worked by the General Mining Association, under the Duke of York's monopoly, was handed over to the Local Government. Since then prospecting has been general throughout the Province, and licenses to explore for short periods, and leases to work for long terms of years, have been taken out in every likely district.

According to the official reports there are now 177 square miles under lease, and 1565 square miles held under license, out of a total area of 19,000 square miles.

Though Nova Scotia was long known, the monopoly that controlled its minerals had made it a new field for the speculator when the government opened it up to the outside world. The usual sequence to one or two successful ventures has not been wanting. The appearance of shrewd promoters, the flaming prospectus of astute experts, the reports by learned professors, and the low-priced shares dancing on the market, have all played their part in catching the eye and alluring the imagination of those inexperienced in mining, of those hastening to be rich, and of those natives who, thinking in the style imputed to be purely

American, considered this Province to abound in *inexhaustible* mineral wealth. Nor has the exploitation of the mines been altogether free from unnecessary expenditure of capital; cheap managers and enthusiastic boards of directors have frittered away means that leave no record. But "experience must be bought," more dearly, perhaps, in undeveloped fields, where competition does not rouse the energies into greatest action, and it has here been bought by an expenditure of about 50 per cent. of the capital invested at the collieries, and of 90 per cent. at the gold mines.

Reserving for a future occasion any further reference to gold mining, an industry of but secondary importance, and referring to that of chief importance, coal mining, I will first speak of this district of Cumberland. Here, one of the most perfect sections of the Carboniferous measures is to be seen on the Joggins shore. For twenty miles, beds of sandstone, shales and coal alternate, and in an unbroken series show no less than 14,570 feet of strata. Eighty-one seams of coal have been counted, measuring from ¼ inch to six feet in thickness. But two of these seams are of workable thickness at the coast; inland they thicken and divide, till at seventeen miles from the coast they are cut off in the broken ground at the foothills of the Cobequids; thence coal bearing measures are deflected to the south, but no workable seam is found until we come to Spring Hill, four miles distant, where some three workable beds have been proved over a distance of two miles. Explorations are still continued, but dislocations and heavy surface-cover retard progress.

On the Joggins and Hard Scabble seams, some eight collieries have, within the last sixteen years, been opened; of these two only are now working. The seams dip at the Joggins shore at an angle of 19°, while at the Styles mine, at the other end of the field, they dip at an angle of 40°. All are entered by slopes, and are worked by machinery of the ordinary light description suitable for small mines. In the opening of these mines $1,250,000 is said to have been expended, and yet the business is but small. In no year has more than 28,000 tons been mined. The Spring Hill coals dip at an angle of 30°. The only seam opened, the Black, is eleven feet thick. On it the works have been laid out with a view to a large trade, and the machinery and appliances are of a substantial character. A branch railroad to Parrsboro' on the Basin of Minas is contemplated to facilitate shipments to foreign ports, while the opening of the Intercolonial Railroad through the field has greatly increased the facilities for transportation, and, should the demand warrant it, the output from this district could soon be made very considerable.

Wages vary somewhat in the different districts of Nova Scotia, colliers making here up to $70 a month; laborers being paid from $1 10 to $1 25 by the day and up to $1 50 by the piece; shiftmen underground getting $1 50, and sinkers $2 a day; machinists, $1 40 to $2; blacksmiths, $1 20 to $1 50; carpenters, $1 15 to $1 50; masons, $1 25 to $2, and overmen (mine bosses), $75 to $90 per month. Board can be obtained for $2 50 a week, but the usual price is $3 and $3 50 a week. Yours respectfully,

SAFETY LAMP.

Gold Bearing Iron Ore from Texas.

TO THE EDITOR—SIR: The following are extracts from a report made by Mr. BALBACH on the gold bearing iron ore of Llano Co., Texas. It goes to show that though Texas has not as yet taken a prominent place among our mining fields, she has a great future before her. Copper ore is being shipped at the rate of 60 tons a week to Baltimore and Philadelphia from Archer, Wichita and Haskell Counties, and I am arranging with Messrs. BALBACH & SON of Newark, N. J., to ship silver lead (cerussite) from Llano Co. to their smelting establishment.

A. R. ROESSLER.

Extract from Report:

"I have carefully examined the specimen of red oxide of iron containing gold, from Honey Creek, Llano Co., Texas, and came to the conclusion from the crystalline form of some parts of it, that the mineral is a decomposed iron pyrite, with some of the crystals retaining their original form, but changed from a sulphide to an oxide. As to the practicability of working the ore, I should advise the mill or quicksilver process, as that is the cheapest and quickest method for treating gold ores of that kind, but if you have furnaces near by, for the reduction of your silver bearing lead ores, I should advise to smelt the gold and silver ores together, as the iron contained in the first serves the purpose of a flux to the latter; but to get quick returns I should advise the first plan and then work the tailings in the furnaces, as they always will carry sufficient amount of gold to warrant it, and the lead in the silver ore will take up the gold. I find the ore to carry by careful assay $21 15-100 ounces of gold or $437 52-100 in coin per ton of 2000 pounds, which is very rich, considering that ore is worked by mill process in California that yields less than $10, and still pays a handsome profit to the owners. (Signed) LEOPOLD BALBACH,
Metallurgist."

Notes.

Peat Fuel.—A new machine, which by the use of artificial heat turns out peat fuel in forty-eight hours, has for some months been in successful operation in Connecticut, and a contract with a railroad company for one lot of 5,000 tons, has been in process of fulfilment, it is said, to the satisfaction of both parties.

An Explosion of Nitroglycerine recently occurred near Parker's Landing, Pa., by which a man named John Osborne lost his life. It appears the explosive was being hauled on a buck board over a very rough road, when going up a hill it is supposed a can must have fallen, when a terrific explosion occurred, killing driver and horse, and so thoroughly demolishing the wagon that no part of it could afterwards be recognised. The shoes were torn from the horses feet, and an excavation five feet deep was made in the road, mostly in solid rock.

The Largest Mine Ventilator in the World is a Guibal fan, 45 feet diameter, 12 feet face, at the Usworth Colliery, near Newcastle-on-Tyne. This fan runs about 45 revolutions per minute, and is said to circulate 200 000 to 250,000 cubic feet of air per minute. It is driven by two first motion engines, 36 inch. diam. cylinders, 3 feet stroke. The upcast shaft is 10 feet diameter, and 600 feet deep. The workings in three seams are ventilated through it. The output of the Usworth Colliery is about 1,500 tons per day. The mines are very extensive. All the under-ground haulage is performed by machinery; two of the three seams are worked on the bord and pillar system; the other is worked on the long-wall plan.

The use of Improved Pumps at Sea.—The investigation into the disaster to the transatlantic steamer *L'Amérique* has just been concluded by the committee appointed by the French government. According to the report of the committee, the vessel was not weakened by the lengthening process, and is even now perfectly sound. It appears that the vessel had on board a new English double circulation pump, a piece of machinery concerning whose operation the chief engineer was so ignorant that all the time he was trying to pump the water out of the hold, he was diligently pumping it in at the rate of two hundred cubic metres an hour. Under these circumstances it was not remarkable that the vessel should have filled rapidly; and if the officers had not given it up and abandoned the ship, they would doubtless have succeeded in sinking her by continuing their intelligent use of the pump a while longer.

The Manufacture of Charcoal in the Upper Peninsula, Mich., is carried on in square and coned kilns, and in pits. The square kilns in this district vary in size to suit circumstances. The round kilns are usually 22 feet high, with cone top, holding 25 to 40 cords. They are usually built against a bank, and fed through an aperture near the top of the cone, which aperture is closed by an iron door luted at the joints with a paste of lime. After being properly filled and fired, the door through which the charge is finally drawn is sealed, and the kiln allowed to burn an average of seven days, before the vents around the base are closed and the mass within allowed to cool off.

A kiln of soft wood of 25 cords produces 40 bushels of coal per cord, weighing an average of 12½ lb. to the bushel, and the hard wood from 16 to 20 lb. to the bushel. The same quantity of wood in pits makes 37 bushels of coal, of heavier gravity than the kiln coal, but does not always have the preference, on account of the sand and dirt mixed with it. The quantity of coal required to make a ton of iron, from 66 per cent. ore, is 100 bushels of hard, or 120 to 140 bushels of soft, according to the kind of wood used. The hard-wood coal will bear a blast pressure of from one to one and one-half pounds steadily, and the soft-wood coal one-half to one pound.

There are nineteen charcoal furnaces in the district, requiring an average of 380 kilns—large and small, domed and square—having an average capacity of 32 cords each per charge. They can be operated with at least three charges every sixty days, and in this time would consume 36,480 cords of wood, or in one year 218,880 cords. An acre of land in this district yields on an average about 35 cords. At this rate a single stack eats up 329 acres per annum.

COAL TRADE REVIEW.

Import Duty on Coal.

Anthracite free. *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, July 25, 1874.

The Production of Anthracite Coal for the week ending July 18, 1874, was as follows:

Ton of 2240 lb.

	WEEK. Tons.	YEAR* Tons.
Wyoming Region.		
Delaware and Hudson Canal Co	31,833	1,328,616
Delaware, Lackawanna and Western R.R	32,790	1,377,513
Pennsylvania Coal Co	27,917	675'138
Lehigh Valley R.R	24,939	552,028
Pennsylvania and New York R.R	459	34,707
Central Railroad of New Jersey	821	737,933
	118,759	4,705,935
Lehigh Region.		
Lehigh Valley R.R	57,486	1,691,570
Central Railroad of New Jersey	18,848	553,022
†Danville, Hazleton & W. B. R.R.	896	16,036
	77,230	2,261,578
Schuylkill Region		
Philadelphia and Reading R.R	10,484	2,437,220
Shamokin and Lykens Valley	19,281	413,165
	29,765	2,850,385
Sullivan Region.		
Sullivan and Erie R.R	1,601	18,981
Total of all the regions	227,355	9,836,879

* Year beginning Jan. 1.
† From the Penn. R.R. Co.'s report, July 14.

The Production of Bituminous Coal for the week ending July 18th, was as follows:

Ton of 2000 lb.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Cumberland and Pennsylvania R.R	60,372	1,162,864
Cumberland Branch R.R	8,571	136,486
Barclay Region, Pa.		
Barclay R.R	14,863	170,733
Broad Top Region, Pa.		
Huntingdon & Broad Top R.R	2,974	127,128
For the week ending July 14.		
Clearfield, Region, Pa.		
Snow Shoe	983	35,598
Tyrone and Clearfield	12,389	320,248
Allegheny Region, Pa.		
Pennsylvania R.R	2,706	121,478
Pittsburgh Region, Pa.		
West Penn. R.R	2,943	105,766
Southwest Penn. R.R	39	4,330
Penn. and Westmoreland gas coal, Pa. R. R.	23,654	489,060
Pennsylvania R.R	9,597	225,579
Kanawha Region, W. Va.		
Chesapeake and Ohio R.R	3,332	83,027
Pictou Region, Nova Scotia.		
Week ending July 18, 1874.		
Consigned to the United States	1,946	28,926
" " " West Indies	615	3,422
" " Canada	5,156	37,582
" " Other provinces	2,981	25,179
Block House Region, Nova Scotia.		
Week ending July 11:		
Consigned to the Provinces	450	4,326
" " " United States	1,868	3,304
St. Louis Region.		
Reports to July 12t, 1874.		
Belleville and Southern Illinois RR		126 048
Ohio and Mississippi RR		72,768
Illinois and St. Louis "		72,885
St. Louis, Vand., Terre Haut and Ind. RR		50,000
St. Louis and Southeastern RR		46,280
Cairo and St. Louis (narrow gauge) RR		14,702
Ind. and St. Louis RR		9,670
Toledo, Wabash and Western RR		1,054
Chicago and Alton RR		4,216
Iron Mt. RR. (semi-Anthracite from Ark.)		675
Rockford, Rock Island and St. Louis RR		1,470
By Illinois River		1,320
" Ohio and Cumberland River		12,515
Warrior Region, Ala.		
South and North Alabama Railroad		9,773
Cahaba Region, Ala.		
South and North Alabama Railroad		1,977
Pittsburgh Region.		9,735
Keeling & Co		51,314
Weitengel & Gormley		5,848

Saw Mill Run Railroad	64,598
Castle Shannon Railroad	69,280
*Cleveland and Pittsburgh Railroad	128,210
*Pittsburgh, Cincinnati and St. Louis RR.	286,522
*Erie and Pittsburgh Railroad	85,376
*Pittsburgh, Fort Wayne and Chicago RR.	97,379
Monongahela Nav. Co., Coal	1,740,231
" " " Coke	45,075
	6,083,757

* Coke is included in these reports.

The Production of Coke on the line of the Pennsylvania Railway and branches, as per report for the week ending July 14:

Ton of 2000 lb.

	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	329
Allegheny Region, Penn. R.R.	..	93
West Penn. R.R.	198	29,123
Southwest Penn. R.R	6,696	207,404
Gas Coal, Penn. R.R.	740	21,150
Pittsburgh Coal, Penn. R.R.	96	39,274

Our table of production gives for the week 227,355 tons as against 230,080 tons for the previous week, and 450 644 tons for the corresponding week last year. The total production for the year is 9,836,879 tons, as against 10,112,449 tons for the corresponding period of 1873. These figures show a decrease for the week of 223,289 tons, and for the year of 275,570 tons. The figures of last year we take from the Pottsville *Miners' Journal*.

The receipts at Port Richmond were 0000 tons; shipments, 30,000 tons; and balance on hand 71 000.

The receipts at Greenwich, Philadelphia, were: bituminous 4243 tons, and gas coals 10,250 tons; shipments: bituminous 3,483 tons, and gas coals 958 tons; balance on hand: bituminous 1848 tons, and gas coals 10,150 tons.

The receipts of anthracite coal at Coal Port for the week were 5933 tons, and shipments 6541 tons; at South Amboy the receipts were 9,131, and shipments 9,466. At both ports, since January 1st, the receipts were 518,647 tons, and shipments 486,519 tons, showing an accumulation of stock this year of 32,128 tons.

The production of Cumberland coal from January 1st to July 18, inclusive, was 1,160,135 tons of 2240 lb., as compared with 1,251,976 tons for the corresponding period last year. The production for the week was 61,557 tons, as compared with 63,704 tons for the corresponding week in 1873. This shows a decrease of 2,148 tons for the week, and for the year of 98,842 tons.

The Delaware and Hudson Canal Company has in stock, at Rondout, 35,000 tons; at Honesdale, 370,000 tons, and at Weehawken 15,000 tons.

Wholesale Prices for August of Anthracite f.o.b., at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna and Scranton at E'port & Hoboken	5 10	5 20	5 30	5 45	5 95	4 90
†Pittston at Newburgh	4 95	4 95	5 05	5 15	5 70	4 80
Wilkesbarre at Port Johnston	5 10	5 20	5 30	5 45	5 95	4 90
Plymouth, R. A.	....	....	5 30	5 45	6 05	4 90
Susque. Coal Co. at Amboy W.A.	5 10	5 20	5 30	5 45	6 05	4 90
Kingston at Hoboken	5 10	5 20	5 30	5 45	5 95	4 90
Lehigh Coals.						
Old Company at Port Johnston	6 05	....	6 00	6 00	6 15	5 20
Old Company's Room Run	5 55	....	5 55	5 55	5 90	4 90
Sugar Loaf at Port Johnston	6 05	....	6 00	6 00	6 00	5 05
Lehigh Coal Exchange	5 90	....	5 85	5 85	6 00	5 05
Honey Brook at Elizabethport	5 90	....	5 85	5 85	6 00	5 05
Spring Mt. C. Co. at Hoboken	5 90	5 90	5 85	5 85	6 00	5 05
Beaver Meadow at South Amboy	5 90	....	5 85	5 85	6 00	5 05
Schuylkill Coals at Port Richmond.						
Schuylkill white ash	4 60	4 70	4 80	4 95	5 45	4 00
Schuylkill red ash	...	....	4 95	5 05	5 50	4 25
Shamokin white and red ash	....	....	....	5 00	5 55	4 45
N. Franklin	....	....	5 40	5 40	5 45	4 25
Lorberry	....	....	5 75	5 75	5 75	4 35
Lykens Valley	....	....	....	6 40	6 40	4 95

* f. o. b. in New York Harbor.

† These are the rates for Pittston coal. Buyers having registered contracts will be charged 15 cents less than above prices.

Per ton.

Freight from Hoboken and Weehawken to New York..... 40c.
" " Elizabethport & Port Johnston, to New York. 45c.
" " South Amboy to New York..... 50c.
" " Newburgh to New York..... 65c.
" " Port Richmond, "Phila." to N. Y. alongside 95c.
" " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered"..... 50c.

Retail Prices.

per 2000 lb. are as follows:

	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 90	$6 10	$5 20
Delaware & Hudson, delivered	6 85	7 10	6 35
Scranton, in yard	7 00	7 25	6 55
Wilkes-Barre, delivered	6 85	7 10	6 35
Lehigh & Locust Mountain,	7 25	7 75	6 75
Schuylkill Red Ash	8 00		

Anthracite.—As has been the case during the whole season, there is a better demand as the end of the month approaches, coming from buyers anxious to take advantage of the prevailing prices. This will, undoubtedly, be but temporary and, when the declared prices of next month go into effect, we are likely to settle down into the dullness which has existed since the majority of the season contracts were made early in the season. There are some indications that the demand from manufacturing establishments is upon the increase, and we are much pleased to hear it, but are afraid, it being so faint, that it may again expire, as it has done on one or two occasions already this year. The retail yards are, as a rule, quite full, and doing but little business. During years past consumers have been advised to lay in their stock during the summer, expecting thereby to procure the lowest prices of the season. This year they have not procured their winter's supply as heretofore, and when cool weather approaches a very active trade in this direction is expected. In supplying the domestic requirements the same "hand to mouth" purchases are observable as are seen in nearly all other kinds of business, and the brisk trade which has been observable from year to year at certain seasons, may be distributed over a longer period by the majority of consumers only purchasing for their immediate needs.

Previous to the date of our last, we were informed by an officer of the Company that the Philadelphia and Reading Railroad would not resume work until the 1st of August. Since then we have received a circular stating that they were to resume work last Monday, 20th inst.

Freights are more firm than at the date of our last. The rates to Boston being from $1 20@$1 25; from Philadelphia the rates are: to Boston $1 50; Providence, $1 25; and to this city, alongside, 95c. Although a reaction has taken place from the prices in existence two weeks ago, as was expected, yet no great advance is anticipated from the quotations of to-day, and we are likely to see a continuation of low rates for the balance of the year.

In another of our columns will be found advertised the usual monthly sale of the Delaware, Lackawanna and Western Railroad Company, which takes place on the 29th inst. The amount offered is 25,000 tons, which is the same as last month.

Bituminous.—There is nothing new to note in this description of coal. New orders continue quite scarce. All the vessels arriving at Georgetown and Baltimore are being taken up, shippers being anxious to dispose of as much coal as possible, under the existing low rates of freight. There are but very few vessels arriving at these ports, and, although freights have not advanced, yet it is quite probable that it will be necessary for them to do so to attract enough shipping to meet the wants of trade. The rates from Baltimore to Boston are $1 50, and from Georgetown, $1 65. Owing to the scarcity of vessels, coal is already being stocked on the wharves at Baltimore, and should there not be more arrivals some of the companies will have to curtail or stop their production.

There are 2,000 tons of Ohio caking coal in this market, afloat on barge, held at $9 per ton; but that price is far above the market.

In this city there is nothing new in foreign or gas coals. We note the sale of 40,000 tons of Youghiogheny coal from the "Waverly" Mine to the Pittsburgh Gas Light Company.

The arrivals of Provincial coals at this port from January 1st to July 22 were as follows: from Pictou, 473 tons; Caledonia, 8,772; Block House, 774; total, 9,989 tons.

Cargo Prices of Bituminous Coal.

	At the Shipping Ports.	Alongside in New York.
Per ton of 2240 lb.		
Westmoreland and Penn, at Greenwich, Phila.	$6 25	$7 65
" " at S. Amboy	7 00	....
Red Bank Cannel Pa., at Phil.	8 50	9 50
" " at S. Amboy	9 00	....
" Orrel, "	7 00	7 65
" " at Phil.	6 25	....
Youghiogheny, Waverly Co, at Baltimore	6 00	7 65
Despard, West Va., "	5 50	7 40
Murphy Run, W. Va. at Baltimore	5 50	7 40
Fairmount, W. Va "	5 50	7 40
Newburgh Orrel, Md. "	5 50	7 40
Cannelton Cannel, W. Va., at Richmond.	11 00	12 00
" Splint, " "	5 50	7 50
Peytona Cannel, " "	....	12 50
Sterling " Ohio	....	14 00
Straitsville, " Lyonsdale Cannel	....	11 50
At Sundusky, O	3 90	....

FOREIGN GAS COALS.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	@12/6d	7 50@ 8 00
Liverpool House, Orrel at Liverpool	20/	13 00
Ince Hall Cannel "	52/	18 00
" Gas, Cannel "	40/	15 00
Scotch Gas, Cannel at Glasgow, nominal.	28/ Gold.	9 50
Block House, at Cow Bay, N.S.	2 25	6 00
Caledonia, at Port Caledonia	1 87½	5 50
Glace Bay, at Glace Bay	2 00	5 75
Lingan, at Lingan Bay	2 25	6 25
Sydney, International and Reserve mines, at Sydney	2 25	5 75
Pictou, Albion and Vale mines, at Pictou	2 50	6 50

STEAM AND HOUSE COALS.

Broad Top, at the mine, $1 25; at Port Richmond, Phil	4 75@5 00	6 00@6 25
Cumberland, at Georgetown and Alexandria, Va	4 30@4 40	6 50@6 75
Clearfield, Derby, "Kiaming and Sterling," at the mines, $1 25; at Greenwich, Phil	4 75@5 00	6 25
James River, carbonite, at Richmond, Va	6 75	9 00
" bituminous, "	4 00	6 25

Retail Prices in New York.

Per ton of 2000 lb.

Liverpool House Orrel	$20 00@22 00
Liverpool House Cannel	....@25 00
American Block	16 00@....
Straitsville Cannel	16 00@....
Carbonite	12 00@....

Coal Trade of Philadelphia.

PHILADELPHIA, July 23, 1874.

Reported by our special correspondent.

There is no special movement to note in either the bituminous or anthracite coal trade in this city, or in the regions tributary to the Pennsylvania and the Reading Railroad Companies. Business is extremely dull, and while the Reading Railroad Company have issued a circular notifying the trade of a resumption of transportation, the independent trade, those not connected with the "pool," cannot get 50 per cent. of the cars they need. The most of these gentlemen control special coals carefully prepared, and for which they have a steady market from old customers. It will never do in these slack times to allow them to get to market a full supply of their coal to compete with the "pooled coal" controlled by the Reading Coal and Iron Company. Hence discriminations by the Reading Railroad Company, (which is the same thing practically as the Coal and Iron Company,) which deprive the independent operators of all the advantages which spring from their experience, careful preparation of coal, and long standing with the trade. By the last report of the Reading Railroad Company it appears that the Coal and Iron Company then owned about ninety thousand acres of coal lands. Within the last month this company has made an additional purchase of ten thousand acres (the Valley Spring tract) at a cost, it is said, of a million and a quarter of dollars. At the progress they are making in "rooting out" individual operators, destroying competition, and in buying lands which they cannot probably use, they will soon have a monopoly of all the lands in the Valley of the Schuylkill. Coastwise freights have improved a little, $1 40 to $1 50 to Boston may be accepted as a basis for freights to other ports.

Line Prices for July, 1874.

Wholesale—Per ton of 2240 lb.

Specially reported by the Riverside Coal Co, Wilkes-Barre, Pa.

AT	Lump and Broken.	Egg.	Stove.	Chestnut.
L. & B. Junction, Pa., for line of P. & N. Y. R. R.	2 95	2 95	3 20	3 20
Mauch Chunk, Lehigh coal	3 50	3 50	3 75	3 25
" Wilkes B. coal	3 50	3 50	3 75	3 25
Port Carbon.*	2 75	3 00	3 15	2 40
† Schuylkill Haven*	2 83	3 08	3 23	2 48
‡ Port Clinton*	2 94	3 19	3 34	2 59
Buffalo, N. Y., f. o. b., per 2000 lb	6 25	6 25	6 70	6 20
Buffalo, N.Y. afloat, per 2000	5 75	5 75	6 20	5 75
Rochester, " " " "	5 50	5 50	5 95	5 45
Weedsport " " " "	5 20	5 20	5 65	5 15
Syracuse, " " " "	4 80	4 80	5 25	4 75
Ithaca, N. Y., f. o. b. and afloat, per 2000 lb	4 65	4 65	5 10	4 60
Charlotte, N.Y. f.o.b. 2000 lb	5 75	5 75	6 20	5 70
Auburn, " afloat "	5 10	5 10	5 55	5 05
Elmira, " " "	4 45	4 45	4 85	4 60
Oswego, " " "	5 25	5 25	5 70	5 20
Oswego, " retail delivered per 2000 lb	7 00	7 00	7 45	6 95

* Broken coal for these points is 10 cents per ton above these figures.

† By Railroad and Canal.

‡ By Canal.

"Erie Line" Agency,

Delaware and Hudson Canal Co. and Pennsylvania Coal Co.

	Stove.	Grate and Egg.	All other Sizes.
Weehawken Junction and all stations to Passaic Bridge main line	6 20	5 80	5 70
Hawthorne and all stations to Mahwah main line	6 05	5 65	5 55
Suffern and all stations to Sloatsburg main line	5 80	5 40	5 30
Turners and all stations to Oxford main line	5 65	5 25	5 15
Pond Eddy and all stations to Lackawaxen main line	4 80	4 40	4 30
All stations on N. R. R. Branch	6 90	6 50	6 40
All stations on Hackensack "	6 60	6 20	6 10
All stations on Newark "	6 20	5 80	5 70
All stations on Newburgh "	5 65	5 25	5 15
All stations on Newburgh and New York branch	5 70	5 30	5 20
All stations on Newburgh and Hawley branch	4 70	4 30	4 20
Piermont and Blauvelt ville on Piermont branch	6 10	5 70	5 60
Nanuet and all stations to Tallmans on Piermont branch	6 00	5 60	5 50
Kipps and Campbell Hall on Montgomery branch	5 95	5 55	5 45
Neely Town, Beaver Dam, and Montgomery, on Montgomery branch	6 05	5 65	5 55

Baltimore, Md.

July 22, 1874.

Reported by our special correspondents.

WHOLESALE PRICES PER 2240 lb.

ANTHRACITE.

	afloat.	at depot.
Wilkes-Barre, "Lee," or "Diamond,"		
Lump, steamboat or broken	$5 05@$5 10	$5 60
Egg	5 45	5 90
Stove	5 57	5 90
Pittston and Plymouth.		
Lump, steamboat, and broken	....	5 35
Egg and stove	....	5 65
"Boston" (free burning,) all sizes	5 45	5 65

Shamokin, red or white ash, all sizes	5 45@5 60	5 50@5 60
Lykens Valley, red ash, all sizes	5 50	5 80

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, $7@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point for cargoes		4 60@4 85
West Va. Gas Coal f. o. b. at Locust Point		5 50@...
Kanawha Cannel, coarse		13 00@....
Tyrone		7 25@....
Ritchie Mineral of West Virginia		1 00@....

Boston.

July 22, 1874.

Reported by our Special Correspondent.

The market is very quiet, and without change.

CARGO PRICES TO TRADE.

Lingan coal	$6 37	Westmoreland	8 50
Caledonia	6 00	WarelyCo.Youghiogheny	8 50
Picton	$6 75@ 7 00	Cannelton Cannel	14 00
Block House	6 25	Cumberland	6 45@ 7 00
Red Bank Cannel	11 00	Anthracite,	5 75@ 8 00

Burlington, Iowa.

July 18, 1874.

Specially reported by Messrs. WIGHTMAN & CUMMINGS, wholesale and retail dealers and shippers of coal.

There is not much activity in this market. Still, trade keeps up very well considering the season, and prices continue firm, with little reduction. We quote:

Per ton of 2000 lb.

Lehigh Lump	$15 00	Illinois Smithy	$6 00
Lackawanna	11 00@11 50	" Steam	3 75
Blosburg Smithy	13 00	Connellsville Coke	12 50
Pittsburgh "	10 00	Illinois "	10 00

Buffalo, N. Y.

Reported by our Special Correspondent.

July 22, 1874.

Per ton of 2000 lb.

Youghiogheny Gas Coal	$5 50	Connellsville coke	$6 50
Briar Hill	5 25	Stirling Cannel	6 75
Fairmount and Red Bank	4 25	Red Bank "	5 75
" Nut	3 50	Stirling Gas Coal	....
" Slack	2 75	Beaver "	....
Catfish Lump	4 25	Cameron	3 75
" Nut	3 75	St. Mary's	3 75

Briar Hill coal, and Stirling and Red Bank cannels, at $8; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel. Retail prices $1 per ton additional, delivered.

Grate	6 25	Stove	6 70
Egg	6 25	Chestnut	6 20

Chicago, Ill.

July 20, 1874.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

No change in prices of coal.

Retail prices per ton of 2000 lb. delivered to buyer.

Lehigh Lump	$10 50	Walnut Hill (W. Va.)	6 50@ ....
Lehigh prepared	10 00	Midway (West Va.)	6 50@ ....
Lackawanna, Wilkes-Barre and Pittston, Grate, egg, and chest	8 50	Cannel	8 00@ 9 00
		Blossburg	8 50
		Indiana Block	6 50
Stove or range	9 00	Hocking "Brooks"	6 50
BITUMINOUS.		Wilmington and Illinois	5 00
Briar Hill and Erie	7 50@		

Cincinnati, O.

July 21, 1874.

Specially reported by Messrs. A. BUCHANAN & Co., wholesale and retail dealers in coal and coke.

Please continue quotations as per last week's report.

Per ton of 2000 lb.

	Bush.	Tons.
Youghiogheny, or Pittsburgh, afloat	12 c.	$3 12
Pomeroy coal	8 c.	2 08
Cannel coal	18 c.	4 68
Semi Cannel	10 c.	2 60

The following are retail prices delivered:

Youghiogheny	16 c.@	$4 16@$
Pomeroy	12 c.@	3 12@
Cannel	24 c.@	6 24@ 6 72
Kanawha Semi Cannel	— 14 .	— — 3 64
Anthracite	— —	— — 11 00
Foundry coke	— 12c.	— —
Soft coke	8c 70c.	— —

Cleveland, O.

July 20, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb.

Youghiogheny, l'p, f.o.b.	$4 65	Straitsville	$3 50
Youghiogheny, nut	3 60	Columbiana	3 75
Briar Hill, (Church Hill)	4 45	Strip Vein	4 00
" " (Brookfield)	4 30	Mountain Blossburg (blacksmith)	6 00
Massillon, according to quality	$3 60 to 3 85	Darlington and Sterling Cannel	4 60
Hocking Valley	3 75		

Council Bluffs, Iowa.

JULY 18, 1874.

Reported by our Special Correspondent.

There is no change in the price of coal at this point. Trade at this time is dull, but the outlook is favorable, and I think in sixty days trade will be good.

Per ton of 2000 lb.

ON TRACK.

Blossburg (blacksmith)	$14 80	Wyoming	13 00
Anthracite	14 00	Missouri	6 00
Iowa	4 50	Kansas	6 00

RETAIL.

Blossburg	$16 00	Wyoming	$15 00
Anthracite	16 00	Missouri	8 00
Iowa	6 50	Kansas	8 00

Detroit, Mich.

July 20, 1874.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

Trade remains about as last reported, with stocks firm at quotations.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep. sizes	9 50	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	8 50	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 00	Erie	7 50
		Massillon	7 00

Denver, Col.

RETAIL PRICES.

Per ton of 2000 lb.

Canon	$6 50	Boulder Valley	$4 75
Marshall	5 50	Eulner	5 50
Murphy	5 50	Black Diamond	5 50
Baker	5 00		

Erie, Pa.

July 22, 1874.

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Anthracite f.o.b. vessels.

Lump	$6 60	Stove	$6 65
Grate	6 10	Chestnut	6 05
Egg	6 10		

Bituminous f.o.b.

Briar Hill	$4 40	Beaver	$4 25

Retail, per ton of 2,000 lb.

Anthracite.

Lehigh, chestnut	$8 50@$9 00
" prepared	8 75@ 9 25
Lykens Valley, stove	9 50@10 00
Lykens Valley, chestnut	8 00@ 8 50
Schuylkill and Wilkesbarre	7 50@ 8 00
Blossburg (Smithing)	7 50@ 8 00

Bituminous.

Chenango Valley (Ormsby), lump	$6 00
Mahoning Valley (Briar Hill), "	5 00
Nut, all kinds	4 00
No. 1 slack	3 06
Bituminous, by car loads to factories	5 35

Indianapolis, Ind.

July 20, 1874.

Specially reported by Messrs. H. McCOY & Co.

A little flurry having sprung up in the Anthracite trade, we are able to break the monotony of our reports by quoting a reduction of 70c. per ton on grate and egg size, 75c. on chestnut, and $1 on stove. The fight is between the Lackawanna, or rather the Delaware and Hudson Canal Co., and the Wilkes-Barre coals. We quote at wholesale, on board cars in city, and will also give you our retail prices for coals delivered.

We quote at wholesale prices on board cars in the city:

Per ton of 2000 lb.

BITUMINOUS.

Best Block coal	$2 80	Indianna cannel	6 50
Best Highland	2 25	Hocking Valley	3 00
Block Nut	1 65	Youghiogheny	5 03
Highland "	1 65	Blossburg (smithing)	7 30
Block slack, per car load	15 00	Piedmont "	7 75
Peytona cannel per ton	8 50	Gas coke, per bushel	9½c

ANTHRACITE (Lackawanna).

Grate	$8 55	Chestnut	8 55
Egg	8 55	Stove	8 55

Retail, per bushel of 70 lb.

Block	14c.	Peytonia Cannel	32c.
Highland	10	Indiana "	28
Highland Nut	8	Youghiogheny	25
Block "	8	Blossburg	27
Slack	6½	Piedmont	30

ANTHRACITE.

per ton.		per ton.	
Grate	$10 00	Stove	$10 50
Egg	10 00	Chestnut	10 25

Louisville, Ky.

July 21, 1874.

Specially Reported by Messrs. BYRNE & SPEED.

We have no general changes to report; some of our smaller dealers are holding Pittsburg at $3 75 and $4 00 per load, but their sales are decidedly limited.

Our retail prices are as follows:

Pittsburgh, per load of 1900 lb	$3 50
Pomeroy	2 75
Buckeye Cannel	5 50
Peytona Cannel	6 00
Nut and Slack	2 75
Kentucky lump, per load	2 75
" nut, "	2 25
" Slack "	1 30
City-made Coke, per bushel	12c
Kentucky on cars at wholesale per bush.	8½c
Anthracite, per ton	$10 to $10 50

Milwaukee, Wis.

JULY 20, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

The coal trade during the past week has been very dull, purchases being made almost entirely to meet immediate wants.

Retail prices per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 50
Lehigh Prepared	10 50	Blossburgh	8 00
Lackawanna	9 50	Pittsburgh	7 50

New Orleans, La.

July 18, 1874.

Specially reported by Messrs. P. & R. DEVERGES, Wholesale and Retail Dealers in Pittsburgh, Anthracite and Cannel coal.

Please continue quotations of 11th inst. No changes.

Pittsburgh coal, retail, per bbl	65c.
" wholesale	40c.
" per hhd	$6 00
" to steamboats, per box	50c.
" to manufacturers, per bbl	55c.@60
Anthracite, retail, per ton	$12 50
" wholesale per ton	$ 9 00
Spadra (Arkansas) coal, retail, per bbl	75c.
Mt. Carbon, wholesale, per bbl	45c.
" " retail per bbl	65c.

San Francisco.

From the *Commercial Herald*, July 9.

Imports of coal from January 1st to June 30th:

	Tons.		Tons.
Anthracite	3,016	Vancouver Island	26,309
Australian	34,306	Bellingham Bay	3,610
Coos Bay	26,711	Rocky Mountain	313
Cumberland	4,895	Seattle	1,465
English	1,705	Mt. Diablo (5 mos)	88,193

Imports for the week include the cargo per Loch Fleet of 1150 tons from Newcastle, N.S.W. Large supplies en route from the Colonies have a depressing effect upon the general market. Lehigh is jobbing from yards in bulk at $23, and in bags at $27 per ton. Cumberland is quite plentiful, the trade prices of which are in bulk $19 50; $21 50 in sacks, and $22 50 in casks. The coast mines are producing steadily and increasing in quantity, especially the Bellingham Bay and Coos Bay, the former selling at $8 50. The Eastport and other Coos Bay mines are furnishing free supplies at $10. These two last named Bituminous enter very largely into use for household purposes. The California Mt. Diablo mines, Black Diamond and others, continue to produce largely of steam coals, finding ready sale at $6 25@$8 25 per ton for coarse and fine—the latter screenings being preferred by all local factories to the lump. Bituminous from Nanaimo (British Columbia) arrives under a yearly contract, and may be quoted at $11 The Wellington sells at less money.

Pittsburgh, Pa.

July 20, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb. and Bushel of 76 lb.

	per ton.		per ton
Youghiogheny coal	$2 15	Pittsburgh retail delivered	
" coke	2 75	per bushel	9½c@11½c
Connellsville coal	2 25	Anthracite all sizes	$7 00
" coke	3 25	" retail deliverd.	7 50
Pittsburgh coal	$2 00		

St. Louis, Mo.

July 18, 1874.

Specially Reported by the COLLINSVILLE COAL AND MINING COMPANY.

ANTHRACITE.

Per ton of 2000 lb.

	City delivery.
Lehigh Lump	$13 50
Lackawanna and Wilkesbarre	12 50
Semi Anthracite	9 50

BITUMINOUS.

Per ton of 2000 lb.

	E. St. Louis.	City delivery
Washington Indiana—smithing	$4 00	$4 87
O'Fallon, Ills	2 00	3 00
Collinsville and Belleville, Ills	1 75	2 75
Indiana Cannel	6 00	7 00
Missouri Cannel	....	5 00

Retail, 25c. per ton additional.

Toledo, Ohio.

Per ton of 2000 lb.

Scranton, all sizes	$7 50@$8 00	Briar Hill	5 85
Lehigh Lump	10 00	Bituminous	4 50@6 50
Blossburg	@ 8 00		

Halifax, N. S.

July 21, 1874.

Reported by our Special Correspondent.

The prices of coal range as follows:

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$5 25	Little Glace Bay	4 50
Gowrie	4 50	Blockhouse	4 50
Victoria	4 50	Albion (at Railroad)	5 00

Montreal.

July 21, 1874.

Reported by our Special Correspondent.

Our market for bituminous coal continues much depressed, cargoes being unsaleable at cost and vessels lying on demurrage for lack of purchasers. Quotations remain the same except for Newcastle smiths', which has been sold the last week at $7 25.

A large sale has been negotiated here on behalf of the Albion Mine, Nova Scotia, with the Intercolonial Railway for 15,000 tons coal f. o. b. cars at the mine for $2 35, which is equal to $2 65 f. o. b. vessel at Pictou. As the mines had all agreed not to sell under $3, this sale occasions some recriminations. Anthracite coals are now in large stocks. Canal freights have declined to $2 50, and a large number of boats have arrived here. Dealers hold their retail prices, but some large boats are offered at reduced rates and are disposed of with difficulty.

Per ton of 2,240 lb.

Scotch Steam	$6 25@6 50	Cape Breton Steam	$5@5 50
Pictou "	6 00@6 25	Newcastle Smiths	8@8 25

Anthracite at retail, 2,000 lb., delivered:

Egg	$8 00	Nut	$8 00
Stove	8 50		

Toronto, Ont.

JULY 20, 1874.

Reported by our Special Correspondent.

In answer to your request, I take pleasure in forwarding to you a poster, such as is issued here by the Toronto Coal Exchange, on the 1st of each month. The Exchange was only organized in May last, and went into operation on the 1st of June. It consists of all the importers of coal doing business in the city, and is backed up by the shippers, who agree not to sell coal to any one here who is not a member of the Exchange. There has been an advance in the price as compared with what we were selling at before the 1st of June, and the consumers think we are making an enormous profit, whereas the fact is, only a fair profit is made. However, some of the consumers are anxious to bring in a cargo, and are asking for prices from our American shippers. They will probably find that shippers on the other side do not *desire to sell coal*. The quantity of coal brought in this year will be considerably less than last year, as most of the dealers had considerable stock, to carry over the winter.

The following are the prices and terms of the Toronto Coal Exchange.

ANTHRACITE.

	per ton.		per ton.
Broken	$7 65	Chestnut	$7 65
Egg	7 65	Lehigh	9 00
Stove	8 15		

BITUMINOUS.

Blossburgh	7 50	Screenings	5 00
Briar Hill	7 00	Soft Nut	5 50

Fifty cents per ton off these prices if paid when coal is ordered.

Sixty tons of Anthracite coal to parties not retailing, may be sold at 25c. per ton less. Sixty tons, or over, of Lehigh lump, may be sold at sellers' option as to prices.

Sixty tons of Brian Hill may be sold at 50c. less per ton, and for Steamers and Tugs a similar reduction, whatever the quantity.

Bituminous coal for steam purposes, in quantities, may be sold at sellers' option.

The price of broken Lehigh, in any quantity, may be left an open question.

Towing.

No change in the above, full rates may be found in our issue of June 27th.

Programme Prices for 1874 of Schuylkill, Lackawanna, Wilkes-Barre and Lehigh Coals at the New York Shipping Ports.

See our last issue.

Freights on Bituminous Coals from the Mines to Tide-Water Shipping Ports.

See our last issue.

Freights to River and Sound Ports.

No improvement is noticeable in the above freights. Quotations remain nominal.

REVIEW OF THE BRITISH COAL AND IRON TRADES.

The following is a review of our exchanges bearing date to July 8th :

England.—The enquiries for iron have very much improved in the North of England, and considerable sales have been made for immediate delivery, and for deliveries extending over three months. The enquiries for rails are quite numerous, but, for the same lots, they frequently come from several sources, and the real requirements thereby become exaggerated. The shipbuilding trade is very fair, the leading firms having sufficient orders to ensure work for some time, while there are other firms that cannot undertake to execute new orders until next Spring. The coal market in South Durham is in an unsatisfactory condition. Prices for household descriptions keep up, especially as there is a prospect of a strike in South Yorkshire, whilst for manufacturing purposes a considerable fall has taken place in prices. The coal owners are holding meetings for the purpose of considering this matter. In the Tyne and Wear districts there is a fair business being done in all descriptions of coals, excepting manufacturing.

In North Staffordshire it was resolved, on the 2nd inst., by the Iron and Coal Masters' Association, that if the works are to be kept in operation, a further reduction of 20 per cent. is an imperative necessity, and that a general notice be given to terminate all contracts and prices, at the collieries and ironworks, at the expiration of fourteen days.

The strike in South Staffordshire may be stated as virtually at an end. Mr. JOSEPH CHAMBERLAIN, Mayor of Birmingham, as mediator, has brought about a settlement between the masters and men of the Cannock Chase district, and this week about 7000 miners have resumed work. The basis of settlement was as follows : The rate of wages is to rise and fall with the price of coal in the proportion of 3d. per day in wages for each 1/ per ton in coal, the basis to be 3/ 6d per day when the best deep coal is 15/ per sale ton. In the present state of trade, it will be difficult to give full employment to this number of men, and it is thought that before a week has past, the balance of the men on strike will have resumed at the reduction.

The demand for iron is almost suspended for the moment by the uncertainty as to the course of prices on quarter day. There is a probability of some more furnaces being blown in, in this district, but it will be done cautiously, until it is clearly ascertained that trade gives promise of a permanent improvement. There has been no change in the prices of coal, but a decline is inevitable.

In South Yorkshire, there is a very fair amount of business doing in the iron trade, although it is not up to what is expected in better times. On Thursday, the notices expired at the Stafford collieries, and the men brought out their tools. The masters at once proceeded to draw out a portion of their horses, which seems to imply that they anticipate a long stand. This is the first strike in connection with the general notices, but to-morrow, (July 9th) it is expected that about 20,000 or 22,000 men and boys will be idle. The coal owners had a meeting on Thursday at Barnsley, when they resolved to ask the tonmen to submit to a reduction of 10 per cent. on the gross earnings. There is a pretty active business doing in household coals, which is doubtless owing to the threatened stoppage at the pits. There is not so much doing in steam coals as might be expected at this season of the year. Small coal and slack is in fair request, as is also coke. In the West Riding considerable stocks of coal have accumulated at some of the collieries, and the demand is limited. There is a good business doing in Bessemer steel and some kinds of iron, particularly railway material.

On the West Coast the prices of iron have considerably declined during the past week, owing to the makers of iron in West Cumberland accepting lower rates, in order to clear off their present stocks. The demand is rather weaker than last week, and buyers show less inclination to negotiate purchases.

In Lancashire there is not much doing in iron, but like the other districts, a better trade is anticipated, when quarter-day prices are made known. Although the coal trade is not brisk, it is very good for the time of the year.

At Middlesborough, foundry iron is selling at 62/ 6d.@65/, with merchants offering lower. Forge is at 55/@56/. In South Staffordshire, cinder pigs are quoted at £3 10/@£3 15/ per ton; mine pigs of medium brands, £5 10/@£6, and best, ditto, £6 5/@£6 10/. At Barrow-in-Furness, best Bessemer pig is selling at £5 ; No. 2, £4 17/ 6d. ; No. 3, £4 15/ ; No. 4. £4 12/ 6d. Hematite forge iron, No. 1, £4 17/ 6d. ; No. 2, £4 15/ ; No. 3, £4 12/ 6d. ; No. 4, £4 10/ ; white, £4 7/ 6d. ; and mottled, £4 7/ 6d. Indian charcoal pig in London is quoted at £10@£12. In the North of England rails are quoted at £8 10/@£9.

In the North of England best gas coals are sold at 10/ 6d.@ 12/ 6d. per chaldron. South Durham coke is delivered at the furnaces at 17/@18/. In Lancashire the pit quotations are as follows : Arley mine coal, 15/ 6d @16/ per ton ; house coal, 13/@14/; common do., 12/; furnace coal, 11/ 6d.@12/; burgie, 7/ 6d.@9/ 6d. ; and slack, 6/ 6d.@8/ 6d. per ton.

Wales.—The reports from South Wales and Monmouthshire, relative to the iron trade, are very gloomy. There is but very little business being done, and rails have been forced down to £7 10 which, with the present prices of materials, labor, etc., is less than they can be made for. This conclusion has at length been forced on the ironmasters, and on the first day of the month notices were placed on the whole of the ironworks, with an exception in South Wales and Monmouthshire, notifying the stoppage of all contracts at the end of the month. What the reduction will be will not be known until the end of the month.

The Coal owners' Association met on Thursday, (July 2nd). but nothing definite was arrived at. The intention of the association, it is believed, is to follow in the wake of the ironmasters, with, perhaps, a less per cent. reduction. The market remains tolerably steady, and large quantities of the best steam and other coals have been exported. If the tendency of the next few weeks is to a strike, prices will harden. Coke is a drug, but there is not much made. Patent fuel is in request from foreign buyers, and large quantities are manufactured near Cardiff. Best steam coal, f.o.b., is quoted at 16/@17/.

Scotland.—There yet remain some districts where the men have not submitted to the reduction, but the greater portion of them have now done so, finding, after a long effort, that they were fighting a hopeless battle. The deliveries of pig iron out of store, last week, were quite large, as much as 1500 tons being ordered out in a single day. The prices of warrants have ranged from 73/ 6d.@80/, with transactions to-day at 77/ 6d., cash. The following were the shipments of pig iron from Scotch ports :

SHIPMENTS.

Week ending July 5th, 1873	11,680 tons.
" " July 4th, 1874	6,112 "
Decrease	6,568 tons.
Total Decrease since December 25th 1873	139,334 "

IMPORTS OF MIDDLESBRO' PIG-IRON INTO GRANGEMOUTH.

Week ending July 4th, 1874	1,501 tons.
" " July 5th, 1873	430 "
Increase	1,071 tons
Total increase for 1874	31,269 "

The following are the rates of freight on pig iron : To New York and Quebec, 7/ 6d. ; New Haven, 12/ ; Montreal, 12/ 6d. ; Boston and Philadelphia, 15/.

In coal, the amount of business being transacted is quite limited, although there is considerable inquiry. Sales are only effected by making concessions. The following are the quotations, f.o.b., at the Glasgow Harbor cranes :—Wishaw main coal, 9/@10/ 6d. per ton ; house coal, 10/@13/; splint coal, 8/ 6d.@11/ 6d. ; steam coal, 12/@16/ ; smithy coal, 18/.

IRON MARKET REVIEW.

New York.

July 24, 1874.

No improvement is noticed in the iron trade ; prices still show a weakness, and, if anything, it is somewhat increased. The outlook for a greatly improved trade during the balance of the year is by no means encouraging. Last week there was considerable enquiry for rails, but it has not resulted in business, and this week we find trade back to where it has been for months.

The *Bulletin* of the Iron and Steel Association, of the 23d inst., gives full statistics of the pig iron production of the United States for 1873, as compared with 1872, which, for lack space, we are unable to publish this week. The production for 1873 amounted to 2,868,278 tons, and our imports 154,780 making a total of 3,023 058 tons. The whole number of finished stocks, July 1st, 1874, was 673, with an estimated capacity of 4,500,000 tons, which we believe is not too high. Assuming, say 3,500,000 tons as the consumptive requirements of the country, we find a capacity for manufacturing 1,000,000 tons in excess of this.

The questions now arising are, who shall curtail production to meet the bare necessities of consumers, or what shall be done to find a market for the surplus. The larger the production, the less will a ton of pig iron cost ; hence all will produce what they can find sale for, and place a reasonable amount in stock. This must necessarily prevent a rise of prices beyond such as will give a living profit, until the consumptive requirements of the country again overtake the production, which will not probably be for several years. As we have before suggested, we must manufacture iron at a cost that will permit us to compete in the markets of the world. That many of our thinking ironmasters have had this opinion for a long time there is no doubt ; but there is a large majority who will not look the matter in the face ; until they do the manufacture of iron must be to many of them an unprofitable business. Iron for some time to come will likely rule at prices below the cost of manufacturing at many furnaces, compelling them to close, and leave the business to those best located. With no chance of a large consumption of iron for some time by the railroads, our largest consumers, the outlook is not encouraging.

American Pig.—Prices are nominally the same, viz.: No. 1 foundry, $30@$32 ; No. 2, $28@30 ; gray forge, $26@28, although our best companies have a stronger inclination to shade quotations at which they claimed to stand firm two weeks ago. We note the sale of about 800 tons Thomas iron at $32 for No. 1 X, and $29 for No. 2 X ; also 1000 tons No. 2 forge on private terms. There have been additional sales from the Lehigh Valley, amounting to about 2000 tons, at $32 for No. 1, $30 for No. 2, and $27 50 for gray forge. The Thomas Iron Company have blown in an additional stack during the week, while there are other companies talking of blowing out, which is greatly due to the unfavorable exhibit of their Profit and Loss accounts, for the six months ending with June.

Scotch Pig.—The market has been very quiet and sales have been mostly 5 and 10 ton lots, the aggregate of which is not worthy of note. In the absence of business we nominally quote as follows : Summerlee, $36 ; Eglinton, $33 ; Coltness, 39@40 ; Glengarnock, $36. Our latest mail advices from Glasgow show that there was some improvement in the legitimate demand, although prices were wholly sustained by the movements of speculators, who had full control of the market. The number of furnaces in blast was about 75. From a private telegram we get the following quotations : Coltness, 112/; Glengarnock, 92/; Langloan, 197/; Carnbroe, 90/; Summerlee, 107/; Eglinton, 85/.

Iron Rails.—We note the sale of 600 tons of Foreign at $48, gold. Beyond this we are unable to hear of any transactions, and the market has assumed considerable quietness. We quote American at $60, currency, at the works and Foreign at $48@$50, gold, here.

Bessemer Rails.—There are no transactions taking place. American, at mills, are nominally quoted at $97.50, and Foreign, here, $90 gold.

Old Rails.—The enquiry is very light, and there are no sales being made. We nominally quote at $36@38.

Scrap Iron.—We are reported a sale but were unable to authenticate it. We quote No. 1 wrought at $35@36, and cast at $22@28.

Spiegeleisen.—In the absence of transactions we quote nominally at $55, gold.

Cleveland

July 21, 1874.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore.

Prices are unchanged. See our last issue.

Chicago

July 21, 1874.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Prices are unchanged. See our last issue.

Cincinnati.

July 21, 1874.

Specially reported by Messrs. TRAHER & AUBERT, commission merchants for the sale of pig iron, blooms, ore, etc.

Our market has shown some activity during the past week, and prices are firm at our quotations :

Below we give you closing quotations of our pig iron market.

CHARCOAL.

Hanging Rock, No. 1, Foundry	$33 00@34 00	4 mos
" No. 2, "	30 00@32 00	4 mos
" Mill	27 00@29 00	4 mos
Tennessee No 1, Foundry	30 00@32 00	4 mos
Tennessee. No. 2 "	28 00@29 00	4 mos
" Mill	27 00@29 00	4 mos
Missouri, No. 1, Foundry	34 00@35 00	4 mos

STONE COAL.

Ohio No. 1, Foundry	31 00@32 00	4 mos
" No. 2, "	29 00@30 00	4 mos
Ohio Mill	27 00@28 00	4 mos
Missouri, No. 1, Foundry	31 00@32 00	4 mos
" No. 2, "	29 00@30 00	4 mos
" Mill	27 00@28 00	4 mos

CAR-WHEEL.

Hanging Rock, C. B.	50 00@55 00	4 mos
Tennessee "	45 00@48 00	4 mos
Missouri "	45 00@48 00	4 mos
Alabama "	45 00@48 00	4 mos

BLOOMS.

Charcoal	85 00@	95 00	—cash

SCRAP IRON.

Cast	— 80@	—90	—cash
Wrought	1 25@	1 40	—cash
Rails	65@	68	—cash

Indianapolis, Ind.

July 20, 1874.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

The pig iron trade continues dull and prices firm at last quotations. Sales 100 tons No. 1 charcoal Foundry, at $35 50.

New Rails at mill	$64 00@66 00	
Old Rails "	33 00@34 00	
Hanging Rock Charcoal Pig No. 1 foundry	35 50@36 50	—4 mos
" " " " " 2 "	33 50@34 00	—4 mos
" " " " Mid	30 00@32 00	—4 mos

RAW COAL.

Indiana No. 1 Foundry pig (1st furn'e.	32 00@34 00	—4 mos
" 2 " " "	31 00@32 00	—4 mos
" 1 Forge " "	29 00@	—4 mos
" 2 " " "	27 00@	—4 mos
Ohio No. 1 Foundry pig	35 00@36 00	—4 mos
" 2 "	33 00@34 00	—4 mos
" 1 mill	29 00@30 00	—4 mos
Merchant Bar, card rates	52 00@54 00	—3 mos
1st quality C. H. C. Boiler Plates, per lb	6½c	—3 mos
1st " Com. Sheet, for No. 24, W.G. "	4¾c.	—3 mos
1st " Charcoal Sheet " "	6¾c.	—3 mos
Best Bloom Galvanized Sheet, discount 20 per cent		—Cash
2d quality " " " 30 "		—cash

f. o. b. in Indianapolis.

Louisville.

July 21, 1874.

Specially reported by GEORGE H. HULL, Esq.

Prices are steady, but the market is dull, and sales are confined to small lots for immediate use.

The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$33 00@35 00	
No. 2 " " "	30 00@32 00	
No. 1, forge, " "	27 00@28 00	
No. 1, foundry, " Tennessee "	32 00@34 00	
No. 2 " " "	28 00@30 00	
No. 1, forge, " "	26 00@27 00	
No. 1, foundry, " Alabama "	32 00@34 00	
No. 1 " " Iron Mountain "	34 00@36 00	

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores	33 00@34 00	
No. 2, " " "	28 00@30 00	
No. 1, forge " "	26 00@27 00	

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	50 00@54 00	
" " Tennessee "	48 00@50 00	
" " Alabama "	50 00@52 00	
" " Georgia "	50 00@52 00	
" " Missouri "	48 00@50 00	
" " Kentucky "	50 00@52 00	

Philadelphia, Pa.

July 23, 1874.

Reported by our special correspondent.

The iron business is still excessively dull. Pig iron has not been so low or so difficult of sale for years, it can scarcely improve until there is a sharp revival in railroad construction. In 1873, railroads consumed 5½ of the iron produced in this State. In 1874 the consumption from that quarter will not be one quarter of what it was in '73. This is "what's the matter" with the iron interest. No tariffs or special taxes would better it or increase the consumption. There are symptoms of an improvement in the demand for some descriptions of bar iron used for general purposes. Already some of the rolling mills are at work, and, with the low price of the raw material, and the lower schedule of wages, the new departure may prove the beginning of a permanent revival of the general trade. Quotations may be given as follows: No. 1 foundry, $32; No. 2, $30; gray forge, $27; rails at works, $60.

San Francisco.

From the *Commercial Herald*, July 9.

Holders of pig iron are firm in exacting full prices for No. 1 Scotch. We quote Oregon pig iron at $45; Scotch do., $40@$42 50; common, $36@38. The *Oriflamme* is at hand with 80 tons Oregon pig iron (white), which is held at $45.

Pittsburgh.

July 22, 1874.

Specially reported by A. H. CHILDS, Esq., commission merchant for the sale of pig iron, blooms, ore, &c.:

The demand for pig iron is not active, and yet can hardly be considered unusually dull for this season of the year, when business generally is quiet, and many of the mills stopped for their annual repairs and taking of stock. There has been little disposition shown on part of holders to press sales, and prices accordingly remain unchanged.

No. 1 Foundry, anthracite or bituminous	$30 00@31 00	—4 mos
No. 2. " " "	28 00@29 00	—4 mos
Gray forge " "	27 00@27 50	—4 mos
White and mottled " "	24 00@26 00	—4 mos

The Pittsburgh *Commercial* of July 18, reports as follows:

The market for pig metal remains about the same as at date of last report, both as to demand and price, with a slight increase in the amount sold. There is a rather firmer feeling, but the price may still be fairly quoted at $27 00, four months, for gray forge, and $28@$30 for foundry.

A large proportion of the rolling mills are now taking stock and making repairs. Some that are now out of operation will start up next week and the week after, but others that are now in blast will stop during the latter part of this month and beginning of next, consequently we cannot reasonably expect a much more active demand before the latter part of August. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORES.

1,000 tons gray forge	$27 00—4 mos	
750 " " "	27 00—4 mos	
200 " " "	27 50—5 mos	
200 " mottled	25 00—5 mos	
100 " close, gray and mottled	25 00—4 mos	
100 " gray forge	27 25—4 mos	
100 " " "	27 00—4 mos	
100 " white and mottled	25 00—4 mos	
100 " No. 1 foundry	29 50—4 mos	
40 " " "	30 00—4 mos	

HANGING ROCK CHARCOAL.

40 tons mill iron	$31 00@$32 00	—cash.
39 " No. 1 foundry, extra	35 00@ 40 00	—4 mos

LAKE SUPERIOR CHARCOAL.

150 " No. 2 foundry	38 00—4 mos	

ANTHRACITE.

10 " No. 1 foundry	31 00—4 mos	

St. Louis, Mo.

July 17, 1874.

The *Railway Register* reports as follows:—There is no particular change in the iron market at this place, but we note a better feeling and consequently more activity in pig iron. Sales are mostly confined to small lots for immediate use. The Vulcan Iron Works will resume operations next week at the rolling mill. The demand for railroad iron is not very great, yet there is considerable inquiry, and the tone of the market is decidedly more healthy. The receipts for the week ending July 11th were: ore, 3860 tons; pig iron, 935 tons; shipments, ore, 385 tons; pig iron 200 tons.

No. 1 foundry, Stone Coal, Mo	$32 00@$34 00	
No. 2 foundry, "	28 00@ 32 00	
Mill "	26 00@ 28 00	
No. 1 foundry charcoal, Mo	32 00@ 34 00	
No. 2 " " "	30 00@ 32 00	
White and mottled charcoal, Mo	34 00@ 36 00	
Tennessee charcoal No. 1 foundry	33 00@ 35 00	
Alabama " " "	33 00@ 35 00	
Scotch, according to brand	43 00@ 45 00	
Massillon	38 00@ 40 00	
American Scotch	43 00	
Hanging Rock	35 00	
Missouri, cold blast charcoal	48 00@ 50 00	
Tennessee, " " "	48 00@ 50 00	
Kentucky, " " "	55 00@ 57 00	
Alabama & Georgia, cold blast charcoal	48 00@ 50 00	
Missouri charcoal blooms	85 00@	

RAILS.

50 to 60 lb. inclusive	$65 00@68 00	

MISSOURI IRON ORES.

Iron Mountain, per ton	$8 00	
Benton Creek, "	7 50	
Surface ores, "	8 00	
Red and brown hematites, per ton	5 00@6 50	
Pilot Knob, per ton	5 50	
Maramac	6 50	

METALS.

NEW YORK, July 24, 1874.

Gold Coin.—During the week past gold has ranged from 109¾ to 110¼, and closed yesterday at 109¾.

Bullion.—Fine silver bar is quoted at $1 26½@1 27½, gold, per ounce, and fine gold bar at ¼ per cent. discount to par ($20 67, gold, per ounce).

Copper.—The market is very quiet. Small sales have been made at 22¾c.@23c. for outside copper, while the main stock is held at 24c. In our last we expressed the belief that we would have a portion of the 5,000,000 lb., recently exported, returned upon this market. We reiterate the same, and do it upon strong evidence. By cable yesterday the London market was reported a little more active, with Chili bars at £76@£76 10/. Messrs. JAMES & SHAKESPEARE estimate the stock on hand in Liverpool, London, Swansea and Havre, with the amount of Chili chartered and afloat, at 34,233 tons as compared with 40,097 tons at the corresponding time in 1873, and 34,269 tons in 1872. Under date of the 10th of July they say; "The expectations of telegrams from Chili, via Fernambuco, advising charters for the whole of June quite put a stop to transactions in this metal; and the uncertainty as to the effect which these rapid advices between two countries will have on trade, still prevents operations. We therefore note an easier market, although the quantity advised on the 7th inst. as chartered during the past month is moderate, amounting to 2,900 tons sure against 2,400 tons in 1873, and 2,290 in 1872."

Tin.—With the exception of a small jobbing trade, there is nothing doing. We quote Straits at 22½c. to arrive, and 22¾c. in store; English Refined, 21¾@22c.; L. and F. 21@21¾c.; Banca 25¼c., prompt cash, and 26c. 30 days, all gold. Yesterday's cable information reported: Straits, at Singapore, at $25 50, with exchange at $4 02½, and in London at £95@£97. In tin plates there are large enquiries for second qualities, and we are reported sales aggregating 8,000 to 10,000 boxes at $10 12½@$10 37½, gold. The following are quotations for ordinary brands: Charcoal tins, $10 12½@10 37; Charcoal Terne, $9 12½@$9 37½; Coke Tins, $8 11½@$8 25; Coke Ternes, $7 75@$8, all gold. Messrs. JAMES & SHAKESPEARE, under date of London, July the 10th, report as follows: English is now quoted at our list prices, but makers are rather indifferently supplied with orders. Foreign sorts are entirely neglected, and values nominal. The Banca sale of 22,100 slabs is declared for 29th instant, but has produced no effect either here or in Holland.

Lead.—There have been several hundred tons of Domestic sold at $5 70@$5 75. The stock of both domestic and Foreign lead is very small, that of Domestic not amounting to over 400 tons. The Government will insert a notice in the morning papers of the 25th inst., asking for bids on its lead, to be made in thirty days, so that if any are accepted deliveries will probably not be made before September 1st. In view of these facts the market is firm, $5 80 being the present asking price. Western lead can be laid down here at about $6 30 currency. In Foreign there is nothing doing, and we quote at 6¾c.@7⅛c. gold.

Spelter.—The market is very quiet, with a very light stock. Foreign is quoted at 6¼c@6⅝c., gold, and Domestic at 6¾c.@7⅛c., currency.

Zinc.—There is considerable activity in sheet zinc, the sales reported amounting to several hundred casks of Foreign at 8⅛c. Domestic is nominal at 8¼c. The stock of both Foreign and Domestic is very light.

Antimony.—There has been very little doing at 11¾c.@12c.,

Manganese.—The quotations are as follows: Manganite, Ga. and Va., 3c.; N. B., 3½c.; Pyrolusite, N.B., 85 per cent., 5c., and German Manganite, 6¼c. There is considerable inquiry.

Quicksilver.—The demand is still ahead of the supply, and prices as heretofore reported are: in this city $1 42 per lb., and in San Francisco $1 35, both gold. There is a rumor of an advance in London, which we will not give as a truth.

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, July 23, 1874.

Our only advices from the San Francisco Stock Board this week are dated the 16th inst., two days later than our last report of the 14th inst. The list has declined very materially.

The report is as follows:

Savage	79	Imperial	8
Crown Point	73	Raymond & Ely	15
Yellow Jacket	81	Meadow Valley	7
Kentuck	14	Eureka Con. G. Bid asked.	6
Chollar Potosi	61	Ophir	—
Gould & Curry	19	Hale & Norcross	—
Belcher	71		

Boston Stock Market.

BOSTON, July 23, 1874.

We give below the prices bid for Copper Stocks at the closing of the Boston Stock Board. No sales.

Allouez	83¾	Pewabic	—
Calumet and Hecla Co.	133	Phœnix	14
Copper Falls	11	Quincy	31½
Central	—	Ridge	4
Franklin	3¼	Rockland	1
Mesnard	—	St. Clair	—
National	—	Star	—
Petherick	—		

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

THOMAS M. DROWN, Secretary, 1123 Girard street, Philadelphia, Pa.

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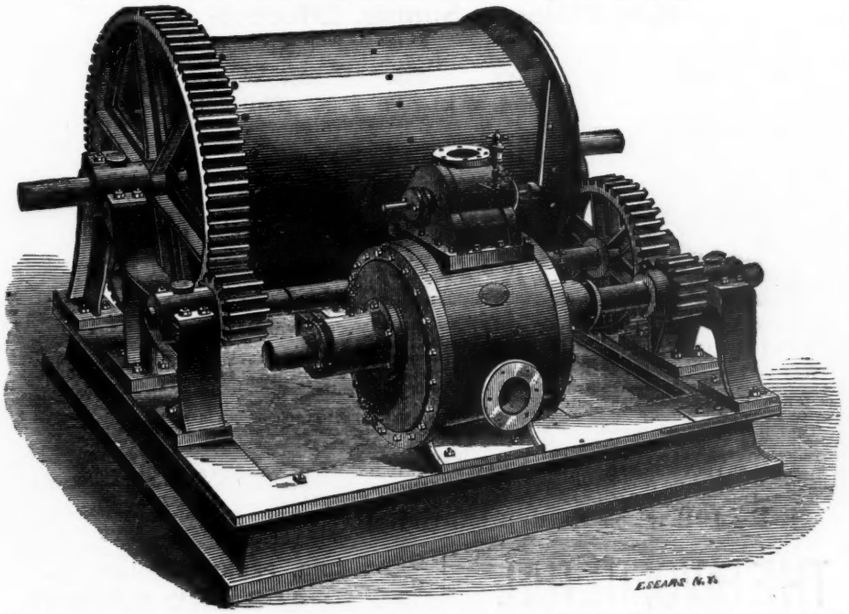
Advertising has furnished me with a competence.—AMOS LAWRENCE.

ROTARY REVERSIBLE HOISTING ENGINES.



We can refer to the satisfactory performance, during the last three years, of over TWO HUNDRED of these Engines, from the little Ash Hoister on steamships, raising 300 pounds, to the Mining and Quarrying Engines, raising 6,000 to 60,000 lb. These Engines have no dead centres; one lever raises, lowers, and holds the load; are simple, cheap, durable, effective.

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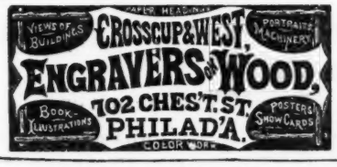
52 Pine street, New York.



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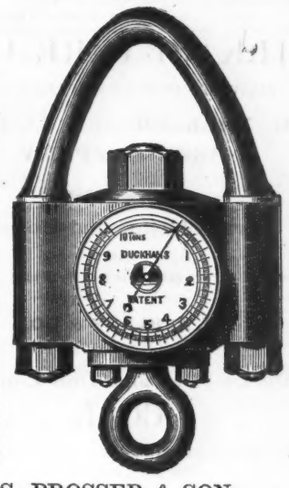

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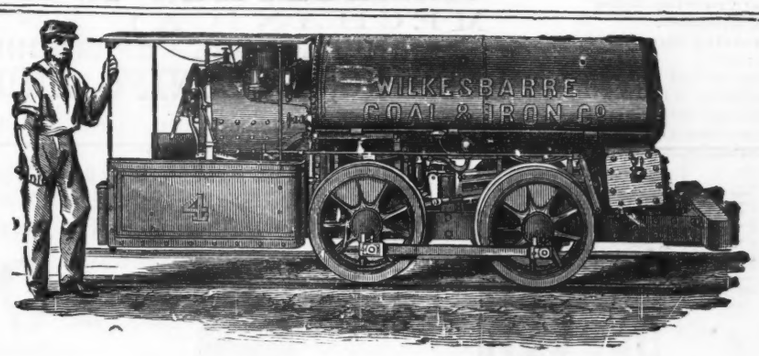

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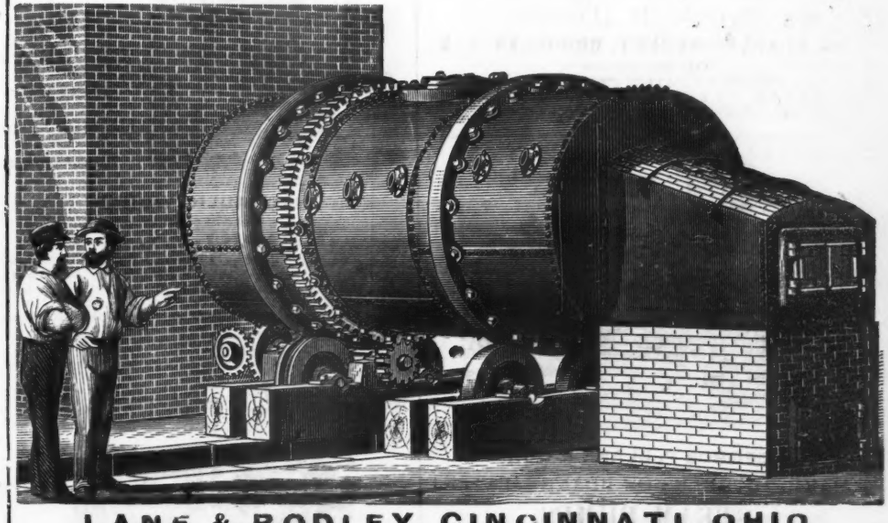

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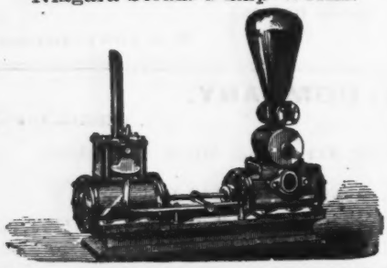

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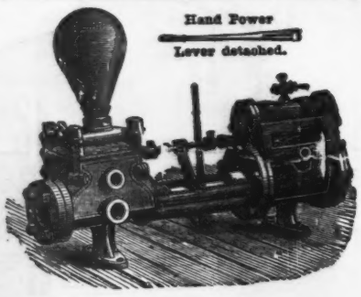

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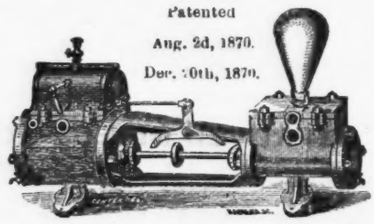

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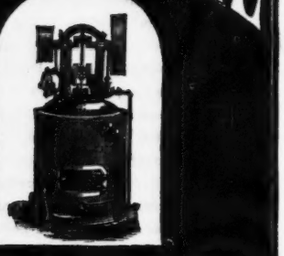

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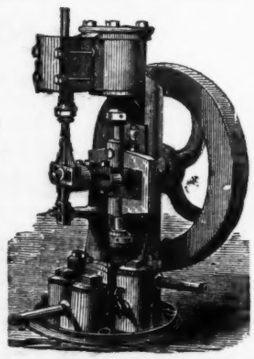

Fig. 1

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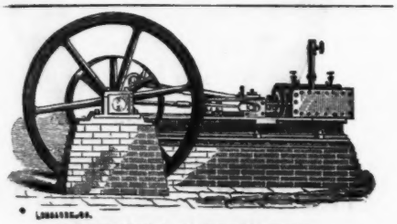

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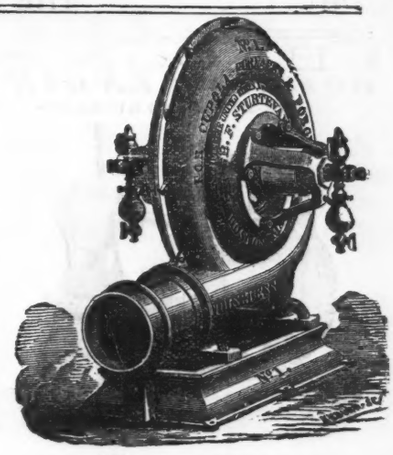

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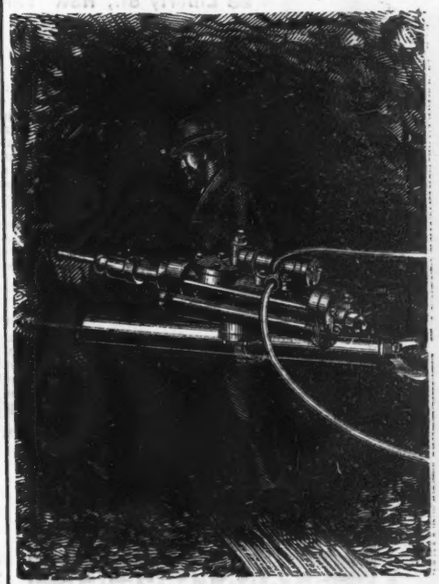

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